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OBITUARY NOTICES OF FELLOWS DECEASED

BETWEEN 30TH NOV. 1860 AND 30TH NOV. 1861.

WILLIAM BALY was born at Lynn, in Norfolk, in 1814, of parents distinguished for their intellectual culture and literary tastes. He was educated in the Lynn Grammar School, and was apprenticed to Mr. Ingle (now Dr. Ingle, of Emsworth), an active and esteemed practitioner of that town.

In 1831 he entered as a pupil of University College, London, and in 1832 at St. Bartholomew's Hospital. At the former he attended the lectures, and at the latter the practice, necessary for the usual diplomas of the College of Surgeons and the Apothecaries' Hall. At both schools alike he distinguished himself by earnest and successful work; and at the end of his pupilage he attached himself to St. Bartholomew's, where he devoted himself zealously to the study of clinical medicine, chiefly under the guidance of Dr. Latham and Dr. Burrows, who even then observed so much of good promise in him that they advised him to prepare to venture on the life of a physician in London. Accordingly in 1834, after obtaining the Diploma of the College of Surgeons and the Licence of the Society of Apothecaries, he went to Paris with a view to the further prosecution of his studies, and, after a winter spent there, to Heidelberg, and thence to Berlin, where he graduated as Doctor of Medicine in 1836.

On his return to England he settled in London, with the view of establishing himself in practice. During the first four years of this period of his career he was occupied with the translation of Müller's '*Handbuch der Physiologie*,' a task which he executed with the same scrupulous care as he gave to all his later works; for he not only rendered the German into English of a better style, but he thoroughly studied and worked through the book, repeating many of the observations it described, and examining many of its doctrines. His annotations to that work, if published separately, would have gained for him the reputation of being an expert and original physiologist.

In 1840, through the recommendation of Dr. Latham, Dr. Baly was appointed to visit and report on the state of the Milbank Penitentiary, where dysentery was very prevalent. This led in the next

year to his appointment as Physician to that establishment. The post was of immense advantage to him. It gave him sufficient means of living, while he had very little private practice. The number of sick under his care was often large; their diseases had peculiar interest; and he was brought into contact with Government officers, many of whom could appreciate his trustworthiness and rare ability. For nearly twenty years during which he held this appointment, among all the changes to which the prison was subjected in its discipline and purpose, and in all the varieties of administration under successive Home Secretaries, inspectors, and governors, he was always well esteemed, always trusted, and very generally referred to as a principal medical adviser of Government on questions of the hygiene of prisons. The chief results of his studies at the prison are comprised in his numerous Reports; but more especially in a most elaborate paper on the "Diseases of Prisons," in the twenty-eighth volume of the 'Medico-Chirurgical Transactions,' and in his 'Gulstonian Lectures on Dysentery,' published in 1847. To the same studies also may be referred much of the knowledge displayed in the Report on Cholera, drawn up in conjunction with Dr. Gull, at the desire of the College of Physicians.

In 1841 Dr. Baly became Lecturer on Forensic Medicine at St. Bartholomew's Hospital. He held that Lectureship for fourteen years; and though, as his simultaneous work at the prison showed, he never forgot that the real business of his life was in Practical Medicine, yet he worked assiduously and conscientiously at the duties of this subsidiary appointment.

In 1846 Dr. Baly was admitted a Fellow of the College of Physicians; in 1847 a Fellow of the Royal Society; in 1854 he became Assistant-Physician to St. Bartholomew's Hospital; and in 1855, in conjunction with Dr. Burrows, Lecturer on Medicine there. He was now fairly in the tide of practice, with every prospect of attaining high reputation as a hospital physician, and of multiplying a hundredfold the value of his knowledge by diffusing it among his pupils.

But his social position was to be yet more eminent, and his influence yet wider. In 1859 some one of adequate fitness was required who might at first share with Sir James Clark, and then hold alone, the office of Physician in immediate attendance on the Queen and

the Royal Family. Those who were charged to make a just selection for this high office wisely fulfilled their responsible task in the choice of Dr. Baly, whose pre-eminent qualifications for the duty were unanimously admitted by the whole medical profession. To himself the appointment is said to have been a surprise ; but how well he justified the selection was shown by the proofs of confidence which he received from the Queen and the Prince Consort, and the esteem in which he was held by the whole of the royal household.

With the highest honours of his profession within his reach, trusted by his Sovereign, esteemed by his brethren, and held in affection by his many friends,—the pride of his two sisters, who had worked lovingly with him in his laborious days,—his prosperous career was sadly terminated and his valuable life in a moment cut off, on the 28th of January, 1861, by one of those fatal chances to which railway travelling is still but too liable, but in this unhappy case apparently baffling human foresight.

Dr. Baly's early death occasioned a wide-spread feeling of grief. Literally he was mourned from the palace to the prison. With the sense of bereavement was mingled that of disappointed hope ; for with his clear and vigorous intellect, his well-balanced and cultivated mind, his devotion to the profession of his choice, his severe sense of duty, his assiduous habits, and his freedom from all controversial tendencies, there was sure promise that, had he been vouchsafed a longer life, he would have yet done much for the advancement of knowledge and the good of mankind.

GEORGE BISHOP was born August 21, 1785, at Leicester. He was well known in the commercial world as the head of the largest manufacture of British wines in the kingdom. Having a taste for astronomy, he erected an observatory in 1836 at his residence, South Villa, in the Regent's Park. He received the services of such observers, among others, as Mr. Dawes and Mr. Hind, who soon gave his observatory a European name. Without entering into details on double stars, *nebulæ*, &c., we shall but say that the South Villa observatory claims eleven of the small planets, ten discovered by Mr. Hind and one by Mr. Marth. It is now removed to Twickenham by Mr. George Bishop, Jun.

Mr. Bishop was successively Secretary, Treasurer, and President

of the Astronomical Society ; he was elected a Fellow of the Royal Society in 1848. He died June 14, 1861. He will stand high among those of his day (no small number) who have devoted commercial wealth to the increase of knowledge ; and will be remembered with all the additional honour due to uprightness and benevolence.

Sir WILLIAM CUBITT was the son of a miller of Dilham, in Norfolk, and at an early age was apprenticed to a joiner. After some years spent in the exercise of his trade, and in the works required for repairing the mills of the district, he entered the factory of Messrs. Ransome of Ipswich. In their employment Sir William became practically acquainted with the details of Civil Engineering ; and about this period of his life he invented the self-winding apparatus of windmills, and the now well-known instrument of prison discipline, the tread-wheel. About 1826 he removed to London and began business on his own account as a civil engineer, and in time attained the foremost rank in his profession. The works executed by Sir William Cubitt on the Norfolk and Lowestoft Navigation, on the Severn Navigation, the South-Eastern and the Great Northern Railways, the landing-stages at Liverpool, the new Rochester Town Bridge, the Berlin Water-works, &c., may be referred to as illustrations of his practical skill ; and it is not too much to say that the manner in which the South-Eastern line is carried between Folkestone and Dover is one of the boldest pieces of engineering of which we have examples in England. In 1851 Sir William was charged with the superintendence of the working details of the Great Exhibition building, and for his exertions on that occasion he received the honour of knighthood.

Sir William Cubitt was born in 1785, and died October 13th, 1861. The date of his election into the Royal Society is April 1, 1830.

Dr. WILLIAM HENRY FITTON, who died in London on the 13th of May, 1861, was born in Dublin in January 1780. His family was originally of Cheshire, but had long been settled in Ireland. After passing through his school education, he entered Trinity College, Dublin, and in 1798, through his proficiency in classics, obtained the

Senior Scholarship. He took his Degree of Bachelor of Arts in 1799.

Although originally intended for the Church, Mr. Fitton chose a medical career, and with that view pursued his studies in the University of Edinburgh, where he also attended the Lectures of Professor Jameson on Natural History, and made the acquaintance of various young men, zealous in study, who afterwards attained to distinction in science and literature. After taking his Doctor's degree, he passed some time in London, studying medicine and chemistry, and in 1812 removed with his widowed mother and his three sisters to Northampton, where he began practice as a physician.

After eight years' stay in Northampton, he married a lady who brought him the means of living independently of his profession, and he accordingly withdrew from practice, and took up his abode in London, where he dwelt for the rest of his life, occupied chiefly with his favourite pursuit of geology, and contributing, by his personal qualities and accomplishments, and by his open hospitality, to promote useful and agreeable social intercourse among the scientific men of the metropolis.

From his youth up Fitton was devoted to geology. Before he left Ireland he collected fossils, determined barometrically the height of the chief mountains, and made excursions into Wales to study its mineral structure. His first publication on the science was a memoir "On the Geological Structure of the Vicinity of Dublin," communicated to the Geological Society in 1811, and printed in the first volume of its 'Transactions.' From 1817 to 1841 he contributed to the 'Edinburgh Review' a series of articles which present a just and enlightened commentary on the progress of geological science for the eventful thirty years of which they treat. But the researches on which the reputation of Dr. Fitton as a geologist will most deservedly and most enduringly rest, "are those by which, during twelve active years of his life (from 1824 to 1836), he laboriously developed the true descending order of succession from the Chalk downwards into the Oolitic Formations, as exhibited in the south-east of England and in the adjoining parts of France. Before these labours commenced geologists had only confused notions as to the order of the strata beneath the Chalk, as well as of the imbedded fossil remains of each stratum. It was Fitton who made the Greensand Formations his

own, by clearly defining the position and character of the Upper and the Lower Greensands, as separated by the Gault*." This statement is from a recent notice of Dr. Fitton, containing further interesting information on his life and labours, and proceeding from an authority unquestionable, both as regards personal knowledge of the man, and just appreciation of his work.

Dr. Fitton was elected into the Royal Society in 1815. He belonged also to the Linnean, Astronomical, and Geographical Societies. Of the Geological Society he was one of the most active and distinguished Fellows; he served for some years as Secretary, and eventually attained to the honour of the Presidency; and in 1852, when he had for some years ceased from active labour, the Society "conferred on their veteran associate the highest honour in their gift, the Medal founded by his dear friend Wollaston."

Sir JOHN FORBES was born in December 1787, at Cuttlebrae, in the parish of Ruthven, Banffshire. In 1799 he went to the Academy of Fordyce, where he formed that friendship with Sir James Clark which remained a source of life-long pleasure to both. Obtaining a Bursary (founded by an ancestor of his mother's) to the Grammar School at Aberdeen, he proceeded thither in 1802; and in the following year he entered at Marischal College in Aberdeen, where he remained until 1806†. From Aberdeen he went to Edinburgh, where he obtained a surgical qualification; and in 1807 he entered the medical service of the Navy, in which he served, chiefly in the North Sea and in the West Indies (where he was present at the taking of Guadaloupe by Sir P. H. Durham, to whom he acted not only as flag-surgeon but as secretary), until 1816. Being placed on half-pay at the general reduction which took place at the conclusion of the war, he returned to Edinburgh, where he spent a year and then graduated. On the recommendation of Professor Jameson he settled at Penzance as the successor of Dr. Paris, and there he remained until 1822, giving his attention not merely to

* Address delivered at the Anniversary Meeting of the Geological Society, 1862.

† Among other Professors whose lectures he attended there was Dr. Robert Hamilton, who gained a high reputation by his published works, but who was locally noted for his extraordinary "absence of mind," of which Sir J. Forbes was accustomed to relate some most amusing illustrations.

professional but also to scientific pursuits, especially meteorological and geological investigations. His "Observations on the Climate of Penzance" and his papers on the "Temperature of Mines" are still quoted as of standard value; and two papers on the "Geology of the Land's End" give further evidence of his zeal and sagacity as a student of Nature. It was during the last year of his residence at Penzance that he published his translation of Laennec's great work on 'Auscultation,' which was at that time but little known and still less appreciated in this country, but which impressed Dr. Forbes's mind with a sense of its value that was soon justified by the general voice of the more enlightened part of the profession. In 1822 he removed to Chichester as successor to Sir William Burnett; and there he continued for twenty years, obtaining the principal practice in the town and in the neighbouring district of Sussex; while there too he formed that friendship with Dr. Conolly which led to their subsequent association in two medical works of great importance. The first of these was the 'Cyclopædia of Practical Medicine,' the publication of which was commenced in 1832 and completed in 1835, under the joint editorship of Dr. Tweedie (to whom the original idea of the work is due), Dr. Forbes, and Dr. Conolly. Besides undertaking a large share of the editorial labour, Dr. Forbes furnished to this 'Cyclopædia' several articles of high excellence, which contributed in no small degree to establish its reputation. Previously to its completion he projected the 'British and Foreign Medical Review,' associating Dr. Conolly with himself as editor; the publication of this journal, which commenced in January 1836, was carried on under their joint superintendence for four years, Dr. Forbes performing nearly all the editorial labour; and on Dr. Conolly's removal to Hanwell in 1840, which occasioned his relinquishment of his connexion with the 'Review,' Dr. Forbes became its sole editor, and continued to discharge that duty until 1847. It was chiefly with the object of improving the 'Review' that he removed to London in 1840, giving up a lucrative practice and a high social position at Chichester, under the full consciousness that he could not expect to attain a corresponding *status* in the metropolis. In the next year he was appointed Physician to the Prince Consort and to the Queen's Household, and he continued to hold these appointments until compelled to relinquish them

by the failure of his health in 1859. He was elected into the Royal Society in 1829.

Although the 'Review' never attained a commercial success, yet there cannot be two opinions as to the importance of the benefits it conferred on the medical profession. Previously to its commencement there had been nothing that deserved to be called full and fair criticism in medical journalism; the so-called 'Reviews' being either mere analyses of the books which they professed to criticise, or confined to a general expression of the opinion formed as to their merits or demerits by writers who were too frequently incapacitated by ignorance or prejudice, or by both combined, to pronounce a trustworthy verdict. It was Dr. Forbes's constant object to secure the services of the best-informed and most impartial contributors whom he could succeed in enlisting; and such was the estimation which the 'Review' soon acquired, not only for its truthful appreciation of the works it criticised, but for the original information contained in many of its articles, that he had no difficulty in assembling around him a staff of able and zealous assistants, over whose productions he exercised a judicious editorial supervision, stamping upon them everywhere his own peculiar marks of justice, accuracy, and vigour. It was his constant object to give an account of the progress of every department of medical science, wherever and by whomsoever made; and by this means he largely diffused an acquaintance with the best foreign medical literature among the profession in this country. Constantly seeking to infuse fresh blood into the organism of which he was the life, he was always glad to avail himself of the assistance of young men who could give the requisite evidence of ability and probity, to whom on his part he afforded the benefit of his wise counsel and kindly aid; and it would not be difficult to point to several men now holding positions more or less distinguished, who would gladly testify how much of their subsequent success they owe to their early association with the 'Review' and with its editor. It was very seldom that he himself wrote more than short 'Notices' of books, or paragraphs interpolated in the longer articles of his contributors; but he departed from his usual course in 1846, putting forth (avowedly as his own) a remarkable article entitled "Homœopathy, Allopathy, and Young Physic;" the purpose of which was in the first place to expose the

errors and absurdities of Homœopathy, whilst bringing into prominence the “vis medicatrix naturæ” as the real agent in its reputed cures,—next to point out that the ordinary routine of medical practice, as carried on by a large proportion of the profession, is scarcely less erroneous in principle and even more mischievous in result,—and thirdly, to assert the doctrine that Rational Medicine should be based on the recognition of the curative powers of Nature as the foundation of treatment, and that it should place its chief reliance on those methods which carry out the indications afforded by the “natural history” of each form of disease, that is, the course it would run if uninterfered with by Art. These views, which he subsequently expanded in a small treatise entitled “Nature and Art in the Cure of Disease,” were put forth in the first instance with an incautious *brusquerie* which raised a storm of indignation against their author, and damaged the reputation of the ‘Review.’ But although what was injudicious in form and manner for a time prevented what was really just and true from obtaining a fair hearing, yet much of the effect which the author strove to produce has gradually developed itself; for there can be no doubt that the practice of the better-educated portion of the profession is now essentially based on the principles which he enunciated; and although various influences have cooperated to bring about this reform, yet no small share of its merit must be assigned to the honesty and vigour with which truths were spoken out in ‘Young Physic,’ which conservative timidity would have continued to keep in reserve.

The advance of years and other circumstances determined Dr. Forbes in 1847 to relinquish the editorship of the ‘British and Foreign Medical Review,’ and to transfer his property in it to its publisher, who has made it his constant aim to keep up the high tone impressed on it by its originator, and to maintain the position he acquired for it as the “leading medical journal,” not only of this country, but of the world.

With the exception of the small treatise just referred to, Dr. Forbes did not make any further additions to professional or scientific literature; but he published, under the name of ‘A Physician’s Holiday,’ an account of a summer excursion in Switzerland, which acquired a popularity that led him to two further ventures in the same line, respectively entitled ‘Memorandums made in Ireland,’

and an 'Excursion in the Tyrol.' In 1852 the University of Oxford conferred upon him the Degree of D.C.L., and in 1853 the honour of knighthood was bestowed upon him. At the end of 1854, having been requested by Government to organize and superintend a large hospital at Smyrna for the sick of the Crimean war, he accepted the post with alacrity under the promptings of that earnest desire to make himself useful in his day and generation which had shown itself in his previous undertakings, and actively commenced the necessary arrangements; but with more time for deliberation and consultation with friends he began to question whether his physical powers would be equal to the post, and finally determined to resign it. Not long subsequently he had the first warnings of that failure of nervous power which progressively increased, until in 1859 he found it necessary to withdraw altogether from active life, and to remove to the residence of his only son at Whitchurch near Reading, where he gradually and tranquilly sank, his death occurring on the 13th of November, 1861.

Although Sir John Forbes cannot be ranked among those who have advanced the science of medicine by the discovery of new facts or the promulgation of new principles, he must be regarded as having done most essential service to the cause of progress, on the one hand by his ready recognition and zealous diffusion of every novelty of sterling value, on the other by the determined onslaught which he made upon prevalent errors, and the vigorous earnestness with which he pleaded for generally-neglected truths. In the depth and extent of his knowledge, in his sagacity as a reasoner, in the earnestness of his search for truth, in his fearless courage in proclaiming it, in his single-minded devotion to right and justice, and in the disinterestedness with which he sacrificed all personal considerations to promote the general good, Sir John Forbes combined all the best qualities of a Reformer. When we add to this estimate his ardent love and extensive knowledge of literature, the general liberality of his sentiments, the wide range of his sympathies, the geniality of his disposition, and that active benevolence which ceaselessly urged him to employ every means in his power for the promotion of objects of public philanthropy, and for the individual benefit of those who had acquired a peculiar claim to his regard, we have such a combination of admirable qualities as could not but command for him

the general respect and esteem of his contemporaries and the warm attachment of a large circle of private friends.

The Royal Society has lost a young and promising associate in Mr. HENRY GRAY, who was cut off by an attack of small-pox on the 8th of June, 1861, at the early age of thirty-six.

Mr. Gray was Lecturer on Anatomy at St. George's Hospital, and had been nominated to the office of Assistant Surgeon to the Institution. During the brief career vouchsafed to him, Mr. Gray laboured assiduously and with much success in Anatomy and Physiology. In 1849 he gained the triennial prize of the Royal College of Surgeons for an Essay on the "Anatomy and Physiology of the Nerves of the Human Eye," and soon afterwards he presented a paper to the Royal Society "On the Development of the Optic and Auditory Nerves," which was published in the 'Philosophical Transactions' for 1850. Another contribution, entitled "On the Development of the Ductless Glands of the Chick," appeared in the volume for 1852. He then undertook an important research into the Anatomy and Physiology of the Spleen, in the prosecution of which he was aided by an allotment from the annual grant placed at the disposal of the Royal Society by Parliament for the promotion of science; and his labours were rewarded by the triennial "Astley Cooper Prize" of £300 in 1853. Two papers on more strictly professional subjects appeared in the 'Medico-Chirurgical Transactions.' His last work was a 'Systematic Treatise on Anatomy,' which was published in 1858, and has rapidly gone through two editions. Mr. Gray was, moreover, an accomplished and lucid teacher of anatomy, and much esteemed in private life, so that his early death was very widely lamented by his professional brethren. His election into the Royal Society took place in 1852.

EATON HODGKINSON was the son of a farmer at Anderton, in the parish of Great Budworth, Cheshire, where he was born on the 26th of February, 1789. When but six years old he lost his father; and in compliance with the wish of his uncle, the Rev. Henry Hodgkinson, Rector of Arberfield, Berkshire, he was sent to a classical school, in order to fit him for a university course, with a view to his entering the Church. The youth, however, had little

turn for languages, and it was determined to send him to the private school in Northwich to learn mathematics, to which he had shown a strong inclination. He seems to have profited greatly by the instruction he received there, for in after-life he often expressed his gratitude to his early master, Mr. Shaw, for laying the foundation of his future mathematical acquirements.

In 1811 his mother and family removed to Manchester, where Mr. Hodgkinson assisted his mother in carrying on business, by which she eventually earned a competency. In Manchester he had full scope to follow the bent of his mind for mathematical and physical pursuits. Here also he made the acquaintance of various eminent persons distinguished for their scientific attainments or manufacturing and engineering skill; and, following the example of some other young men of his acquaintance who were desirous of improvement, he became a pupil of Dr. Dalton, then a private teacher of mathematics in Manchester, and read with him the works of Lagrange, Laplace, Euler, and Bernoulli. The friendship thus begun continued uninterruptedly until Dr. Dalton's death.

The erection of the factory of Phillips and Lee first gave occasion to Mr. Hodgkinson's experimental inquiries into the strength of materials used in construction, which, amongst other results, led him to propose a new form of cast-iron girder. He discovered that cast iron resists compression with an energy nearly six times as great as that with which it resists extension; and he accordingly recommended a form of cross section, in which the upper and lower flanges present sectional areas corresponding with the power of resistance to compression and extension respectively; and this form has now been universally adopted. At the works of Messrs. Fairbairn and Lillie, then rising engineers, Mr. Hodgkinson obtained the requisite means and facilities for making his experiments.

In 1840 Mr. Hodgkinson communicated to the Royal Society a memoir, entitled "Experimental Researches on the Strength of Pillars of Cast Iron and other Materials," which was published in the 'Philosophical Transactions' for 1840, and obtained for its author the award of the Royal Medal for the year 1841. The results of further inquiries were given in a later paper, published in the 'Philosophical Transactions' for 1857. He was elected a Fellow in 1841. The formulæ he deduced for calculating the

strength and deflexion of pillars and beams have been accepted with implicit confidence, and now have a place in all engineering textbooks.

Mr. Hodgkinson became a Member of the Manchester Philosophical Society in 1826, and from 1822 to 1844 contributed seven papers to its 'Memoirs,' chiefly on the mechanical principles of engineering. He was also an active Member of the British Association for the Advancement of Science, and contributed valuable matter to the 'Transactions' and 'Reports' of that Association.

The combination of experimental skill with mathematical knowledge which characterized Mr. Hodgkinson was turned to account on the occasion of the construction of the Conway and Britannia tubular bridges. He was engaged by Mr. Fairbairn to assist in the experimental inquiry which it was deemed advisable to institute before commencing those great and novel undertakings; and he contributed valuable formulæ to Mr. Stephenson for calculating the true results of the experiments. It is to the results which were then obtained that we owe the application of wrought-iron plain and boxed girders in the art of construction. For a similar reason he was in 1847 appointed on the Royal Commission to inquire into the properties of wrought and cast iron, and their application to railway structures.

In 1847 Mr. Hodgkinson was appointed Professor of the Mechanical Principles of Engineering in University College, London, and delivered several courses of lectures, although in later years delicate health interrupted his labours.

Mr. Hodgkinson married in 1841 Catharine, daughter of the Rev. William Johns, of Manchester, an intimate friend of Dalton. She died childless in little more than a year after her marriage; and, after remaining a widower till within eight years of his death, he married for his second wife (who still survives him) Miss Holditch, daughter of Henry Holditch, Esq., Captain in the Cheshire Militia. He died at Eaglesfield House, near Manchester, on the 18th of June, 1861.

FRANCIS PALGRAVE, K.H., author of 'The Rise and Progress of the English Commonwealth,' 'The Merchant and Friar,' 'The History of England and Normandy:'—born July 1788; died 6th July, 1861; the only son of Mr. Meyer Cohen; assumed the name of Palgrave

on his marriage, in 1823, to Elizabeth daughter of Mr. Dawson Turner of Great Yarmouth.

The bankruptcy of his father, at the beginning of this century, compelled Palgrave to exchange the dream of foreign travel and the expectation of a life of competence for the necessity of working for his living. But he neither shrank from the duties thus unexpectedly laid upon him, nor neglected that mental cultivation which his father's unstinted care had commenced. In his sixteenth year he entered a lawyer's office, and continued there, on the expiry of his articles, as managing clerk till the year 1822.

A home education gave early maturity to his abilities. When but eight years old he translated the 'Battle of the Frogs and Mice,' attributed to Homer, from Latin into French. Before he had attained his twentieth year he had contributed many articles to the minor periodicals of the day; and not many years later he became a regular contributor to the 'Edinburgh' and 'Quarterly Reviews.' Writing for the press and writing anonymously were alike distasteful to him; but as he devoted the whole of his only certain income, that derived from the lawyer's office, to his father, he was compelled to this means of support. His early promise of talent did not fail of fulfilment. He was endowed with a mind quick to acquire languages,—to grasp the laws of physical science,—to appreciate the beauties of poetry and art. He was also gifted with a bright imagination, a thirst for knowledge, and the power of patient industry. Honesty and simplicity of nature ennobled all he said or did, and true humility made him unwilling to trust his own researches, and ready to receive suggestions from minds however different in stamp from his own.

In 1821 Palgrave submitted to Lord Spencer a scheme for the publication of the national records, which was unanimously approved by the Commission of Records, "many glorious things," according to Mr. Hudson Gurney's friendly report, being said of him by all. This took place in 1822, and from that time till 1838 he was occupied in the publication of the 'Parliamentary Writs,' 'Exchequer Calendars,' and other works of great magnitude and historical importance connected with the Commission. He was also engaged on his own literary undertakings, and in practice as a barrister, chiefly in pedigree cases. Much labour also devolved on him as one

of the Municipal Corporation Commissioners, though he withheld his signature from their report. He was knighted in 1831, as an acknowledgment of his contributions to constitutional and parliamentary history; and was appointed Deputy Keeper of the Public Records in 1838, a post which he held up to his death. Previous to his appointment, the national muniments were scattered over fifty-six different repositories, many of them but little fitted for the safe custody of the public archives. A different system of management, a different scale of charges for searches and copies, prevailed in each. By the exertion of great activity and perseverance he brought these various establishments under one system, and finally united their contents at the Rolls Estate. His 'Annual Reports,' twenty-two in number, afford ample proof of the extent of his official labours. He was elected a Fellow of the Royal Society in 1821.

The dates of Palgrave's writings are as follows:—He brought out in 1831 a short history of English affairs from the acquisition of Britain by the Romans until the Norman Conquest; and in the year following, the 'Rise and Progress of the English Commonwealth.' The 'Merchant and Friar' was his next publication. In 1841, after the labour of several years, he furnished Murray with the first edition of the 'Handbook to Northern Italy.' The first two volumes of the 'History of England and Normandy' appeared in 1851 and 1857. These volumes treat of the Carlovingian empire, the rise of the Capetian dynasty, and the foundation of the Duchy of Normandy. Materials are left that carry the narrative to the time of Henry I. He also contributed, principally between the years 1815–21 and 1840–45, upwards of forty articles to the 'Edinburgh' and 'Quarterly Reviews.'

With the exception of the *handbook*, one purpose, the elucidation of our national history, runs through his works. The 'Commonwealth' represents the national life of England before the Conquest. The character of the people and general aspect of the realm is exhibited by an examination of those legal and social institutions which regulated the daily life of the community, as he felt that the attention of historians had hitherto been too exclusively confined to the political action of the times. The little history of the Anglo-Saxons was designed to supply that biographical portraiture and narrative detail necessarily excluded from a constitutional history.

In the 'Merchant and Friar,' Roger Bacon is employed as the expounder of mediæval philosophy. Intimate acquaintance with the curious arts of the middle ages, astrology and alchemy, with physical science, both ancient and modern,—the archæological incidents disclosed by study of the city archives,—a sensibility to the beauties of architecture and nature, supplied the author with ample means towards a just comparison of the arts and customs of the past and present. The illustration of important constitutional principles, as shown, for instance, in the development of trial by jury and of the parliamentary representation of the English counties, even more than a picture of mediæval society and manners, was his object in this story. Especially did he wish to impress upon his readers that essential truth, that our "constitution is based, not upon liberty, but upon law,"—that Parliament is not only an assembly of the political estates of the realm, but a judicial tribunal, that High Court to which even the poorest in the middle ages could apply for justice. In spite of the "wit and wisdom" contained in the 'Merchant and Friar,' the animated pictures of past times and varied display of knowledge, the outpourings of one who loved study for its own sake, it is but an unknown book.

Further investigation of Anglo-Norman history, and that passion for his subject which springs from long-continued research, led Palgrave to abandon his intention of continuing, in one volume, the 'Commonwealth' to the accession of the Stuarts, and he devoted himself to investigate the times that lay nearest to the Conquest. This was, however, to him no brief undertaking. To the right understanding of the process by which our constitution arose after the Conquest, he felt it necessary to treat fully of the Norman dynasty from its first establishment, and to exhibit the parallel between France under the Capetians, and the German empire after the extinction of the Carlovingian dynasty. But he was not enabled to complete this great project before declining powers impeded his progress.

Palgrave sought throughout his writings to enforce certain leading historical principles. Independent study convinced him, at the commencement of his career, "that the states composing Western Christendom were to be considered as carrying on the succession of the imperial authority of Rome," a doctrine upon which, as he be-

lieved, all real conception of mediæval and modern history depended. The insight which led him to grasp this important theory, the "great key of mediæval history," and trace its influence upon the general system of human affairs, has entitled him, in the language of one of his reviewers, to a place in the very highest rank of historical inquirers.

He held an opinion of his own upon that vexed question of our history, the position assumed by William and his Normans towards conquered England. He convinced himself that the idea, upon which Thierry laid such stress, of a bitter war of race against race being waged against the Anglo-Saxons, was greatly overcharged. To him it seemed that the remarkable fact in English history is the practical union of interests, that the continuity of English national life was never broken by the Normans: hence the vigorous and uninterrupted progress of national power. The lessons, however, from past times which he sought to enforce were not exclusively historical.

Political economy was a study of great interest to him. But he never missed an opportunity of pointing out a source of error which, in his opinion, pervaded the whole school—the "considering the science of political economy as being entirely subject to calculation, wholly a matter of figures; whereas in fact the "wealth of nations," even in the narrowest sense of the term, is quite as much rated by passion and imagination, the imponderable elements which evaporate during the analysis, and leave no residuum in the crucible."

Imbued with reverence and deeply stored with the learning of the past, he shrank from that tendency, perhaps more general thirty years ago than now, to contrast triumphantly the progress of modern science with mediæval credulity. He inclined the rather to regret the wisdom that still lingered than to boast of the knowledge that had come. That appeal to "civilization," so common with French historians, as the highest standard of human perfection, was specially distasteful to him. On the contrary, he maintained that all the elements which are really beneficial in nationality are directly at variance with the French idea of civilization—that with national language, national institutions, and national religion it cannot amalgamate.

Art was a subject to which he gave but casual attention; yet in this his appreciation of what is real, and of true taste, gave him an

insight beyond his time. He early claimed for gothic architecture the place it now holds in popular estimation. Years ago he suggested that principle in design, since enforced by Mr. Ruskin, that in the physical world the curve is the token of life or organized matter, as the straight line indicates death or inorganized matter. His article on the "Fine Arts in Florence" (*Quarterly Review*, June 1840) is a fine example of his range of mind, and contains passages eloquent with picturesque description, and stored with sound historical and artistic knowledge.

Few living men have equalled Palgrave in the extent of his reading, still fewer have surpassed him in sincere and independent inquiry. His language was vigorous and often pointedly descriptive. He was capable of vivid biographical portraiture, and of tracing acutely the original development and meaning of laws and titles. Still he lacked some qualifications towards a great historian. His habit of mind was rather that of an advocate than a judge, which diverted him from that perfect judgment which characterizes Hallam and Thirlwall. His feeling for the importance of the laws and social institutions that influenced the daily life of the people prevented him in some degree from grasping the history of the nation as a whole. The habit of dictating his writings tempted him to a diffuseness and redundancy of style; and, not unlike Southey, he has left passages in his writings which are fanciful rather than humorous, and hardly worthy of his powers or of history. This estimate of Palgrave's literary position has been mainly adopted from a criticism on his last volume in the *Edinburgh Review* of April 1859. Notwithstanding failings such as these, the writer assigns to him a place among the highest rank of historical inquirers, and states that the new light which he has thrown upon the ancient institutions of our land, and his share in enabling us to realize the grand picture of mediæval Europe, should secure to him the deep gratitude of every historical student.

He passed, like Scott and Southey, a life of unremitting industry. As his years were continued from occupation to occupation, without the chasm of a single day, so his hours led him on from work to work—the page of history before breakfast, the office in mid-day, his library and books in the evening. Though he could not rest content save in a round of unremitting activity, friendship and home love were still the salt that made life precious

to him. A man so gifted and true-hearted could hardly fail of meeting with worthy love and honourable friendship ; and in these blessings he amply shared. The mutual devoted love and noble companionship that was given to him in his wife formed indeed the keystone of his happiness ; yet friendship was to him no empty word. Deservedly so, for he could claim the affectionate regard of those that really knew him, above all of Henry Hallam and Sir Robert Inglis, and of Hudson and Anna Gurney. Nor did he escape the notice of distinguished men. While quite young, Byron had remarked of him, that he would be at the tip-top of whatever pursuit he embarked in. Describing an ideal translator of ancient German poetry, Scott mentioned Palgrave's name. Later in life we find Dr. Arnold proposing to put questions to him on our history, as the person who could answer them better than any one else.

An animated talker in society, at home he was not less ready to amuse and to instruct. He was so bright and playful, so exceeding in kindness and indulgence, that he was there as a boy among his children, sharing in their talk, joining in their arguments, or telling stories, allegories of his own invention or scenes from history. He ever glowed with kindness and sympathy ; but latterly animation was dimmed by sorrow from which there was no recovery, and by the commencement of that gradual decay of mind and body of which he died. In 1847 he parted with a very dear son for the East ; about five years after that, the best part of his life was buried in his wife's grave. The remaining years were chiefly marked by declining powers and the death of friends, and did but speak to the truth of Hallam's sad words, "time can never reinstate us to the position of domestic happiness." The latter portion of his official life was, however, smoothed to him by the most considerate kindness of Sir John Romilly, a comparative stranger till his appointment as Master of the Rolls.

A mind such as Palgrave's, that adhered instinctively to truth for its own sake, however antagonistic to popular fancy, that turned rather towards the oppressed and humble than to the successful, that was naturally averse to party feeling, and distrustful of the idol of the day,—such a mind, so endowed with wisdom not of this world, so many-sided and imaginative, could not expect to be generally appreciated, or to cause any immediate effect, or to reap the fruit of

its labours. Still, even in this life, he anticipated, in great measure, the reward which is given to those that follow after true knowledge, and strive to guide others in the right way.

General Sir CHARLES WILLIAM PASLEY, K.C.B., of the Royal Engineers, was born at Eskdale-Muir, Dumfries, on the 8th of September 1780. In his early years he displayed the impetuosity and high courage which distinguished him in after life, as well as the perseverance, ability, and liberality for which he became no less remarkable.

Having received a solid preliminary education in Scotland, he joined the Royal Military Academy at Woolwich in August 1796, and obtained a commission in the Royal Artillery on the 1st of December, 1797. He was transferred to the Royal Engineers on the 1st of April 1798, and on the 2nd of August 1799 he was gazetted as first Lieutenant in that corps.

Between 1799 and 1807 he served in Minorca, Malta, Naples, and Sicily, and was employed on various important services and confidential missions. He was sent by General Villette to communicate with Lord Nelson in 1804; and after having been promoted to the rank of second captain on the 1st of March 1805, he served under the Prince of Hesse-Philippsthal in the defence of Gaeta against the French in 1806, and under Sir John Stuart at the battle of Maida (in Calabria) in the same year. The experience of that battle confirmed the strong opinion which he had always maintained—in opposition at that time to many in the British army—that the English generals would beat the French marshals as soon as they got a chance of doing so.

Captain Pasley took part in the siege of Copenhagen under Lord Cathcart in 1807, and joined Major-General Leith at Oviedo in the north of Spain in September 1808. He was employed to reconnoitre the Asturian frontier, and then to communicate with General Blake at Reynosa in November, and he left Soto on the 15th of that month at night as the French entered it. After joining Colonel Robert Crawford's Brigade, he was retained by Sir David Baird as his extra aide-de-camp, in consequence of his general attainments and knowledge of the Spanish language. He soon after joined Sir John Moore's staff in a similar capacity, and was attached to it during the

retreat upon, and at the battle of Corunna. Though a great admirer of Sir John Moore, he was much annoyed at this retreat, and could never afterwards speak of it with patience—his conviction having been that the army ought to have turned round upon its pursuers whilst it was strong, and to have maintained a footing in the Peninsula, instead of waiting to fight at Corunna after it had been seriously weakened by retreat, and then quitting the country. From his intercourse with the Marquis of Romagna and others, he was also convinced that the Spanish troops might under improved arrangements have been made more useful.

Captain Pasley next accompanied the expedition to Walcheren; he was employed in reconnoitring the coasts of Cadsand and Walcheren under the fire of the enemy's batteries; and he was present at the siege of Flushing in 1809. Leading a storming party of 100 men under Colonel Pack, to obtain possession of a French battery on the dyke according to his own proposal, he was first wounded (though not disabled) by a bayonet in the thigh, and then, after reaching the top of the dyke, shot through the body by a French soldier from below, belonging to a fresh party of about sixty whom he challenged to surrender to twenty men. The bullet passed in at one side and out at the other, injuring the spine in its progress, and it was hardly expected at first that he could recover. Portions of bone, sash, and clothes came out of the wound afterwards by degrees, and it rendered him incapable of duty for more than a year*.

In November 1810 Captain Pasley published the first edition of his 'Essay on the Military Policy and Institutions of the British Empire.' This work appeared in a time of great national despondency; and its principal objects were to advocate greater energy and perseverance in prosecuting the war with France, judicious offensive action in the conduct of that war, and especially a more vigorous policy in Spain, and to demonstrate that Great Britain had "sufficient force and a favourable opportunity for destroying the French empire." It attracted great attention, and was highly approved on account of the manly and patriotic spirit which it displayed, though the doctrines of political economy which it contained were disputed. It ran rapidly through four editions, and was favour-

* He took advantage of this opportunity to teach himself German amongst other things.

ably noticed (by Mr. Canning as was supposed) in the 'Quarterly Review' of May 1811, in which it is characterized as one of the most important political works that had ever fallen under the observation of the reviewer. The opinions it expressed were contrasted with the humiliating language then to be found in the pages of the English press, and with the principle of *husbanding* resources which was alike the watchword and the fatal error of the despondents.

Whilst in command of the Plymouth Company of Royal Military Artificers in 1811, Captain Pasley set himself to consider how improvements could best be made in the practice of Military Engineering. He had found on active service the serious disadvantage under which the Royal Engineers laboured, of having no properly educated men at their disposal, and no good system for regulating their operations; and the remainder of his life was chiefly devoted to the supply of these wants. Finding that the ordinary modes of instruction were unsuited to his object, he composed an elaborate treatise intended to enable the noncommissioned officers to teach themselves and their men without the assistance of mathematical masters, on a method similar to that of Dr. Bell and Mr. Lancaster, and to go through their courses of geometry in the same manner as their company drills or their small-arms exercises. The system thus organized was found so successful at Plymouth, that it was introduced on an extended scale into the schools at Chatham in spite of some objections—one critic fearing that the men would become better educated than their officers, and might be consulted by the Generals commanding! His energy and success, backed by the representations of the Duke of Wellington from the Peninsula as to the defective condition of the Engineer Department in the Field, led to the formation of the Establishment for Field Instruction at Chatham, and to his appointment to the office of Director of that establishment, with the rank of Brevet-Major. He was promoted to the rank of Brevet Lieutenant-Colonel in May 1813, and he became a Lieutenant-Colonel in the Royal Engineers in December 1814. Following up his designs, he completed a work on 'Military Instruction' in three volumes, of which the first was published in 1814, and the second and third in 1817. The former contained the course of practical geometry before referred to; the two latter a complete treatise on elementary fortification, including the principles of

the science, and rules for construction, many of which apply to civil as well as to military works.

Finding, in 1817, that his men had been "most grossly ill-treated by the Army Bread Contractor," he was led to inquire into the system under which the army was supplied with provisions; and in 1825 he printed and circulated, but abstained from publishing, a volume containing the result of his investigations. The exposure which he thus afforded of abuses that were prejudicial to the soldier, and the improvements that he suggested and was partly the means of introducing, were in themselves services of great value. In 1818, he published a volume of "Standing Orders," containing a perfect code of military rules for the duties of all ranks in the army.

Colonel Pasley organized, during his residence at Chatham*, improved systems of telegraphing, sapping, mining, pontooning, and exploding gunpowder on land and in water, and laid down rules which, being founded on careful experiment, will always endure, besides preparing pamphlets and courses of instruction on these and other subjects. The volume which contained his 'Course of Practical Architecture' was especially valuable. His work on the 'Practical Operations of a Siege,' of which the first part was published in 1829, and the second in 1832, is still a text-book, and the best that has been written in any language on that subject. Every operation in it was treated as a separate study; and it exposed various mistakes into which the French and German authors had fallen. It was translated into French, and published in Paris in 1847.

Early in 1831 Colonel Pasley prepared a pamphlet, and in May 1834 he completed a volume of 320 pages, entitled 'Observations on the Expediency and Practicability of simplifying and improving the Measures, Weights, and Money used in this country, without materially altering the present standards.' He strongly advocated the adoption of the decimal principle of division in all its simplicity for our coinage, as well as for our weights and measures, and opposed with equal ardour the introduction of the French units into this country.

He sent to the press in May 1836 the first sheets of a work containing 'Observations on Limes, Calcareous Cements, Mortars,

* In addition to these various occupations, he employed privates of Sappers to teach him the native Welsh and Irish languages.

Stuccos, and Concrete, and on Puzzolannas, natural and artificial,' of which the first edition was published in September 1838. It contained considerable discoveries, the results of experiments at Chatham, and led at once to the manufacture in large quantities of artificial cements, under the different names of "Portland Cement," "Patent Lithic Cement," and "Blue Lias Cement."

In connexion with experiments on the explosion of gunpowder under water, Colonel Pasley was led to undertake, and successfully to carry out, the removal of two sunken vessels from the bed of the Thames near Gravesend, in the year 1838. He received for this service the thanks of the municipal authorities, and was presented with the freedom of the City of London in a gold box. Emboldened by the success of these operations, he proceeded to execute the more formidable task of clearing away the wreck of the 'Royal George' from the anchorage at Spithead, and that of the 'Edgar' from St. Helen's. The value of the materials recovered from these vessels was more than equal to the expense incurred in their removal. Portions of six successive summers, from 1839 to 1844 inclusive, were devoted by him to this work; but he never asked for nor received from the Admiralty any remuneration for the important services that he rendered in this manner to the navy and the nation.

Colonel Pasley remained at Chatham till the end of the year 1841, when he was appointed, at the age of 61, to the office of Inspector-General of Railways. During the twenty-nine years and a half that he was at the head of the Royal Engineer Establishment, there was hardly any subject connected with his profession as a military man and an engineer—of instruction, construction, or destruction—that did not benefit by his attention. His presence there was of the greatest advantage to his country as well as to his corps. The corps of Royal Engineers owes, in fact, its existence in its present condition, as well as its high state of efficiency, to his energy, his example, and his exertions; and the success of the British army in many a field has been due in no small degree to the system of instruction at which he laboured so devotedly, and which he rendered so perfect. As the latest example of the advantage of that system we may refer to the recent war in New Zealand, which was brought to a close mainly through the employment of Pasley's methods, by officers (one of them his own son) who had been trained by him at Chat-

ham. The easy and bloodless capture of the native pahs, which resulted from a systematic employment of the spade, proved at once to their defenders the hopelessness of further resistance.

He became a Brevet-Colonel in 1830, a Colonel of Engineers in 1831, and a Major-General in the Army in 1841. He received the honorary distinction of D.C.L. at Oxford in 1844; and in 1846, on relinquishing the appointment of Inspector-General of Railways, he was made a K.C.B. for general services. He held the appointment of Public Examiner at the East India Company's Military Seminary at Addiscombe for sixteen years, up to the year 1855, and took an active part in its management, contributing materially to the high standard which it reached and at which it was maintained. He was elected a Fellow of the Royal Society as far back as 1816; he was also of old standing in the Astronomical, the Geological, the Geographical, the Statistical, and other societies; and he lost no opportunity of contributing to the advancement of practical science. He was also a liberal subscriber to a great number of charitable institutions.

He held no public office after 1855, but occupied himself chiefly in re-editing his works, superintending the construction of pontoon equipages, and in other matters connected with his profession, as well as in advocating the introduction of decimal coinage, devoting a large proportion of his time to the benefit or advancement of his friends and relations. He was promoted to the rank of Lieutenant-General on the 11th of November 1851, and to that of General on the 20th of September 1860.

He was twice married. His first wife died of consumption in a few months, his second died in 1848. Of six children, three survive him. He was well and hearty up to within a week of his death; but his long life of labour was brought to a close at his residence at 12 Norfolk Crescent, Hyde Park, from congestion of the lungs, on the 19th of April 1861.

JOHN T. QUEKETT was born at Langport, Somersetshire, in the year 1815; he was the fourth son of the late Mr. Quekett, head master of the Langport Grammar School, and received his early education in that establishment. Being intended for the medical profession, he was sent to London and apprenticed to his brother,

the late Edwin Quekett, lecturer on botany at the London Hospital, at which institution he pursued his medical studies. After passing the usual examinations, he, in June 1840, obtained by competition the appointment of Student of Human and Comparative Anatomy in the Museum of the College of Surgeons, and at the expiration of the term of his appointment became Assistant-Conservator. While holding these appointments, Mr. Quekett was enabled freely to follow his strong inclination for microscopical research, which had very decidedly shown itself in early youth; and after having formed a most elaborate and valuable collection of specimens of the tissues of plants and animals, including numerous fine injections of the vessels, in preparing which he was remarkably skilful and successful, he was in 1844 appointed by the Council of the College to deliver annually a Course of Demonstrations, with a view to the exhibition and connected description of the collection, and the explanation of the method and resources of microscopical study. This collection, numbering 2500 preparations, was purchased by the College. On the retirement of Professor Owen in 1856, Mr. Quekett was appointed Conservator of the Hunterian Museum, and also Professor of Histology, which appointments he held till his death, which took place at Pangbourne, in Berkshire, on the 20th of August, 1861, at the early age of forty-six.

Mr. Quekett was the author of an elaborate treatise 'On the Use of the Microscope,' published in 1848, and speedily again in a second edition. He also prepared the 'Descriptive and Illustrated Catalogue of the Histological Series contained in the Museum of the Royal College of Surgeons of England,' the first volume of which appeared in 1850, and the second in 1855. In 1852 he published a volume of 'Lectures on Histology,' which was followed by a second in 1854. Besides these separate works, Mr. Quekett contributed numerous papers to the 'Transactions of the Microscopical Society,' of which he was one of the founders, and, after labouring zealously in its service for nineteen years as Honorary Secretary, was elected President in 1860. He was a fellow of the Linnean Society, and was elected into the Royal Society in 1860.

Although best known for his microscopical pursuits, Professor Quekett had devoted himself very successfully to the observation of facts throughout the whole field of natural history. In original

research the character of his mind led him less towards speculation than to the determination of facts ; and accordingly he has left behind him a rich store of trustworthy materials, the result of his acute and careful observation and faithful record. His knowledge on all subjects of microscopic investigation was extensive and accurate, and he was ever ready to give the benefit of it to others, and especially to his numerous medical brethren, who continually sought his aid on questions determinable by means of the microscope.

Professor Quekett left a widow and four children, to whom the Council of the College of Surgeons, in consideration of his merits and services, have kindly and considerately granted a liberal pension.

FRIEDRICH TIEDEMANN, Foreign Member of the Royal Society, was born at Cassel, on the 23rd of August 1781. In his father, Dietrich Tiedemann, a Teacher in the Caroline College in Cassel, and afterwards Professor of Philosophy in the University of Marburg, he was not only blessed with an affectionate and watchful parent, but enjoyed the advantage of an accomplished and painstaking preceptor,—to whose private tuition, indeed, much more than to the teaching of the school and gymnasium, he was indebted for his early educational training, and for a thorough grounding in classical studies.

While yet a boy at the gymnasium of Marburg, to which town his father and family had removed, the young Tiedemann showed a decided turn for those pursuits in which he was destined in after life to become so eminent. He delighted in dissecting and preparing such animals as he could procure, and was thus naturally led to the pursuit of Zoology and Medicine. In 1798 he accordingly entered the University of Marburg, where he remained until 1802, diligently studying medicine and the auxiliary sciences. The progress he made was, however, owing more to his own ardent love of the work he had undertaken than to the professorial teaching of the University, which, one or two chairs excepted, appears to have been at that time conducted in an irregular and slovenly way. For better means of studying practical medicine he therefore went to Bamberg, where he made the acquaintance of Döllinger—and thence to Würzburg ; and having in the mean time returned to Marburg, he took his Doctor's degree in that University in 1804.

Tiedemann's first essay as a teacher of anatomy was made in 1803.

In the winter of that year he delivered the lectures and superintended the practical studies in the anatomical school of Marburg, as substitute for Professor Brühl, who was incapacitated by ill health; and next year, being invited by the Professor, and prompted by his own inclination, he established himself as "Privatdocent" in the University, and gave lectures on Physiology, Comparative Osteology, and on Gall's Craniology, which then attracted much attention. Feeling, however, the need of further preparation, he went again to Würzburg to work at dissection under Hesselbach, and afterwards to Paris, where he studied hard in the great museum of the Garden of Plants, and attended the lectures of Cuvier, Geoffroy St.-Hilaire, Lamarck, Duméril, and Haüy.

On his way to Paris, Tiedemann had made the acquaintance of Soemmering at Frankfort, and gained his favourable opinion; and now, through the recommendation of that great anatomist, who had in the mean time removed to Munich, he was offered the Professorship of Zoology and of Human and Comparative Anatomy in the University of Landshut. This offer, flattering as it was to so young a man, he naturally accepted, and to Landshut he accordingly went in 1805. There he found a new and handsome anatomical theatre, but no collection of preparations or other appliances for teaching. During the first few years of his incumbency therefore he had to labour hard to supply these wants, besides discharging his professorial duties, even to the temporary injury of his health.

The war between France and Austria having broken out afresh in the spring of 1809, Landshut and its neighbourhood became the scene of active military operations, and Tiedemann, in addition to his regular duties, took charge of one of the temporary hospitals established in the place. But in spite of the distractions of these troubled times he steadily pursued his scientific work. In that same year appeared the first volume of his 'Zoologie,' and in 1810 and 1814 the two parts of the second volume. The author's object in this work was to combine zoology with comparative anatomy, and to found the classification of animals upon their organization. On the part which comprehends Birds he bestowed especial pains, and with a view to the preparation of it made numerous dissections, measurements, and observations of various kinds; so that it is still valued as a rich store of information on the class to which it refers.

Two of his minor works, the '*Anatomic des Fischherzens*' and the '*Anatomic-und Naturgeschichte des Drachens*,' having in the mean time appeared, Tiedemann in 1811 made a journey to the shores of the Adriatic to study the organization of the Echinoderms, a subject which had been proposed for a prize-question by the French Institute. The issue of his labours was his great work on the *Holothuria*, *Asterias*, and *Echinus*, which gained the prize, established his reputation as a Zootomist, and brought him a nomination as Corresponding Member from the Academies of Paris, Berlin, and Munich.

The study of the brain—in its structure and development, its differences among animals, its characters in different races of mankind, its defects and deformities—was a subject on which Tiedemann bestowed much labour, both mental and manual. In 1813 he published the '*Anatomic der Kopfloren Missgeburten*,' and in 1816 his well-known description of the anatomy and development of the Fœtal Brain. In this work he described the successive stages of development of the human brain, and showed the correspondence of these transitory conditions with its permanent conditions in animals lower in the scale; and notwithstanding the great advances of this as well as other departments of embryology in later times, Tiedemann's work is still held in high estimation.

These researches on the brain, so happily begun, were continued through many years of Tiedemann's life. The breaking up of the Grand-Ducal Menagerie at Carlsruhe afforded him the opportunity of dissecting several rare animals, and of publishing in 1821 the '*Icones Cerebri Simiarum*.' In 1825 he gave, in two memoirs published in the '*Zeitschrift für die Physiologie*,' a comparison of the brains of the Orang Outang and Dolphin with that of Man; and he has left behind him a large collection of unpublished figures of the brains of animals, which, in the hands of his distinguished son-in-law Prof. Bischoff of Munich, may yet prove serviceable to science.

The comparison of the brain of the Negro with that of the European, to which he next directed his attention, became for Tiedemann a subject of keen interest. After collecting all the materials to which he could find access on the Continent, he made a visit to England in 1835, mainly for the purpose of making examinations and measurements of the brains and crania of different races to be found in

British collections. The fruits of these labours he presented to the Royal Society, of which he had a few years before been elected a Foreign Member, in a memoir entitled "On the Brain of the Negro, compared with that of the European and the Orang Outang," which was published in the 'Philosophical Transactions' for 1836, and appeared afterwards in German as a separate work in 1837. From his extensive researches, Tiedemann arrived at the conclusion that, whilst in the majority of cases the Negro's brain is undoubtedly less than that of the European, there are nevertheless individuals of the negro race in whom the brain is as large as in the Caucasian; and coupling this result with the fact, shown as he conceived by careful historical and literary inquiries, that there is no province of intellectual activity in which individuals of pure negro race have not distinguished themselves, he draws the inference that there is no impassable limit between Caucasian and Negro which should unconditionally denote the one as the master of the other.

In 1816 Tiedemann accepted a call to Heidelberg, where he undertook the Professorship of Physiology, as well as that of Anatomy. His physiology was, like Haller's, founded on anatomy, observation, and experiment. It is true that, while a student at Würzburg, he was for a time an ardent hearer of Schelling, in the hope of a new illumination of biological science through the German "Naturphilosophie;" but his solid sense and the positive scientific progress he had already made soon led him to distrust the allurements of a vain system. It was in this practical spirit that, at a riper age, he joined with the accomplished chemist Leopold Gmelin in those elaborate researches which ended in the celebrated experimental Essay on Digestion (*Die Verdauung, nach Versuchen*, 1825), in which the names of the anatomist and chemist are so honourably associated. Tiedemann also entered on the laborious task of preparing a systematic work on physiology on an extended plan, somewhat after the manner of the 'Elementa' of Haller; and the first volume, embracing general physiology, was published in 1830. The issue of the third volume was prematurely forced upon him by the unauthorized publication of the corresponding part of his lectures; but the work was not further proceeded with, and the part published, although full of learning, and displaying other excellencies characteristic of the author, and although it was translated both into French and into English, at-

tracted comparatively little attention. At that time, indeed, the revived and improved use of the microscope in physiology, the more exact application of physical experiment, and other influential causes were about to introduce a mass of new materials into the science, and to involve a fresh handling of the old in any systematic treatise that should be up to the actual state of knowledge; and it is probable that advancing years and other cares indisposed the author to persevere in what had become an arduous task.

Tiedemann meanwhile did not intermit his labours in human and comparative anatomy. He had, in conjunction with Oppel and Liboschitz, projected a work on the anatomy and natural history of Reptiles; but, in consequence of the death of his collaborators, it went no further than the part on Crocodiles, which appeared in 1817. In 1820 he published a monography of the Ursine Sloth; in 1822 his '*Tabulæ Nervorum Uteri*,' which he dedicated to the Royal Society, and in the same year came out the '*Tabulæ Arteriarum Corporis Humani*.' This grand work, though not exactly faultless in every point, has, more than any other, contributed to spread abroad the name of Tiedemann; for the figures it contains have been reduced and copied and disseminated, in collections of anatomical plates and in anatomical systems and hand-books, in every part of the world where anatomy is taught. A supplement, containing additional figures of varieties in the distribution of the arteries, was published in 1846.

Besides the works noticed in this brief sketch, Tiedemann was the author of various minor essays and memoirs, published separately, or contributed to Transactions of Societies and Journals. He was also associated with the two brothers Treviranus in conducting the '*Zeitschrift für Physiologie*.' A complete list of his writings is appended to a memoir of his life read before the Bavarian Academy of Sciences, by his son-in-law Professor Bischoff, from whence the facts in the present notice have been mainly derived.

In 1807 Tiedemann married the daughter of the Obervoght of Rastatt, whose family name was von Holzing; and with her he lived in happy union to the end of his days. She bore him seven children, of whom three survive him. Unhappily three of his sons were drawn into the revolutionary movement in Baden in 1848, for which the eldest paid the forfeit of his life, and the other two had to exile them-

selves from their fatherland. These deplorable events weighed all the more heavily on the old man, as his own political tendencies were strongly conservative. Added to these family afflictions, a growing infirmity of his eyesight induced Tiedemann to withdraw from public duty, and to retire in 1849 to Bremen, and thence soon after to Frankfort. There he met with a kind reception from numerous attached friends, and in 1854 he was honoured by the celebration of his "Doctor-Jubilæum," on the fiftieth anniversary of his promotion to the Degree of Doctor. On this occasion not only his immediate friends and countrymen, but men of science in all parts of the world joined in the general testimony of respect ; and a medal, bearing his likeness, was struck in commemoration of the event. Having recovered a very serviceable degree of vision by a successful operation for cataract, he continued to enjoy his retirement, and to gratify his passion for natural scenery in summer excursions among the Bavarian Alps ; but after a time he became subject to attacks of bronchitis, under which he finally sank on the 22nd of January, 1861.

Tiedemann, besides a thorough acquaintance with the literature of his special department, possessed a large stock of accurate general information—the fruit of diligent reading and personal observation, favoured by a singularly exact and capacious memory. His private as well as his public life was characterized throughout by elevated sentiment, manly independence, and strict integrity. We have already mentioned the special honour conferred upon him in his old age ; and as a further evidence of the esteem in which he was held, we may add that he was elected a member of no less than sixty-two learned Academies and Societies. He was also raised to the rank of Privy Councillor by the Grand Duke of Baden, and received orders of Knighthood from Baden, Bavaria, Greece, and Prussia. His election to the Foreign Membership of the Royal Society took place in 1832.

OBITUARY NOTICES OF FELLOWS DECEASED

BETWEEN 30TH NOV. 1861 AND 30TH NOV. 1862.

PETER BARLOW, Esq., was born at Norwich in October 1776, and died at Charlton in Kent on the 1st of March 1862. After going through an ordinary school education, he chose mathematics as a special study, and obtained the place of Mathematical Master, and subsequently that of Professor, in the Royal Military Academy at Woolwich. During the earlier part of his career he gave his attention chiefly to pure mathematics; and his first original work was 'On the Theory of Numbers,' which appeared in 1811. In that work he shows an acquaintance with the writings of foreign mathematicians to an extent at that time unusual. In 1814 he published a Mathematical and Philosophical Dictionary; also his well-known Mathematical Tables, which, besides other cognate matters of use and interest, gives the factors, squares, cubes, square roots, cube roots, and reciprocals of all numbers up to 10,000. This work having passed out of print, and a decided opinion being entertained by some discriminating authorities of the practical usefulness of its chief contents, the tables, so far as indicated above, the factors excepted, were republished in stereotype under the sanction of the Useful Knowledge Society in 1840.

In 1817 Mr. Barlow published a work on the Strength of Materials, based on extended experimental inquiries carried on by himself. In this way he was brought into friendly relation with the leading engineers and architects of his time, was much consulted in reference to important works of construction, and served on more than one Government Commission on great engineering questions. He next turned his attention to the subject of magnetism in general, and especially to the deviations of the compass-needle caused by local attraction, and the best means of correcting it. His researches form the subject of his 'Essay on Magnetic Attractions,' published in 1820, and of seven papers communicated to the Royal Society from 1822 to 1833. These labours of Mr. Barlow were so highly esteemed, and the method he devised for correcting compass-errors, although confessedly not perfect, was at the time deemed of so great practical value, that in 1825 he received the Copley Medal from the Royal Society "for his Various Communications on the Subjects of Magnetism."

Mr. Barlow also applied himself to the improvement of achromatic object-glasses, and in 1827 communicated a paper on that subject to the Royal Society. In the further course of his inquiries he was led to try the effect of substituting, for the flint-glass lens of the usual achromatic combination, a concave lens formed of transparent fluid enclosed in a glass capsule having surfaces of appropriate curvature. The idea of employing fluid lenses, it may be observed, was not new: it had occurred to Newton and David Gregory, and had even been practically applied by Dr. Blair of Edinburgh. Mr. Barlow made choice of sulphuret of carbon as the fluid, which, with a refractive power about equal, has a dispersive power more than double that of flint-glass. He demonstrated the practicability of his method by constructing two telescopes on that principle, with a result sufficiently promising to obtain for him the support of the Board of Longitude in the further prosecution of his experiments. The Council of the Royal Society also, sensible of the important scientific bearing of Mr. Barlow's proposal, engaged Mr. Dollond to construct a fluid-lens telescope under Mr. Barlow's superintendence, and submitted the instrument to be practically tested by competent judges in order to decide on the expediency of constructing a telescope of much larger dimensions on the same principle. The trial instrument is described by Mr. Barlow in the *Philosophical Transactions* for 1833; and Reports on its performance, by Sir J. Herschel, Mr. Airy, and Captain (now Admiral) Smyth, will be found in the *Proceedings* for December of the following year. From the trials made, it appeared that Mr. Barlow's principle might be advantageously applied to the construction of a great refracting telescope to be employed in the observation of nebulae and for certain other astronomical purposes; but the project seems not to have been further proceeded with.

Besides publishing the memoirs and treatises mentioned above, Mr. Barlow during his active career was a large contributor to the '*Encyclopædia Metropolitana*.' He retired from the duties of his Professorship in 1847. In May 1823 he was elected into the Royal Society. He was one of the original Fellows of the Astronomical Society, and a member of several of the leading Societies in Europe and America.

JEAN-BAPTISTE BIOT, the last of that powerful school of science which grew up during the first French revolution, cannot here be the subject of a detailed scientific biography. The wide extent of his labours would alone render this difficult; and when it is added that a large part of this extent contains matters in which the position of Biot and of others could not be discriminated in few words, difficulty merges in practical impossibility. And this is rendered still more obvious when we state that we do not so much refer to actual points of disagreement commenced and continuing, as to matters in which anything short of a minute and cautious handling would probably create new discussions which had better find a natural origin in the statements of professed historians. Of these matters some are of very old date, and may therefore be said to have passed into history; while this very circumstance makes it more desirable to dwell especially upon the personal life of one who was born under Louis XV. and lived to the age of eighty-eight in the full enjoyment of high faculties. Of this personal life we are able to give some account from documents on which we can rely.

Biot was born at Paris, April 21, 1774. His father, Joseph Biot, was an *employé* at the Treasury, whose ancestors had been farmers in Lorraine. The son, after a classical education at the college Louis-le-Grand, and some instruction in mathematics from Mauduit, was placed, against his wish, with a merchant at Havre, who employed him in copying letters by the thousand. Disgusted with this occupation, he volunteered for the army as soon as the legal age of eighteen was attained, and served as an artilleryman in the army of the North at the battle of Hondschoote in 1793. Declining the promotion offered on condition of permanently engaging himself, he remained a few months, at the end of which a severe illness made him desirous of returning to his parents. The military authorities were very slow about the dismissal of volunteers who were likely to be useful, so Biot took his departure for Paris, with nothing but his serjeant's certificate, in September 1793. Walking feebly along the road, he was overtaken by a smartly dressed person in a cabriolet, who invited him into his carriage, and entered into conversation with him. Finding that he was going to Paris, the stranger pointed out the danger of his purpose, a recent ordinance having made it death for soldiers to approach the capital. Biot

persisted, and his companion then offered to take him all the way. This stranger, whoever he was, gained their free passage through military posts, and sent patrols about their business by a mere whisper. At Compiègne, the young volunteer was summoned before a revolutionary committee, then and there sitting, on the evidence of his uniform. But his examination had hardly commenced when his companion entered the room in violent anger and addressed strong reproaches to the Committee, which were answered by humble apologies. When they arrived at Paris, Biot desired to know the name and address of his protector, and was answered *St. Just, Rue de la Michodière, Hotel X*——. The story, one would suppose, ends here with full explanation of all that had taken place. But when Biot, after an illness of several weeks, presented himself at the address given, he was told that no such person had ever lived there. In later years Biot made many efforts to clear up the mystery, but never could get beyond a doubt. So far the notes from which we write. We add that it is notorious that the formidable leader of the revolution was on his way to Paris about the time in question, having been commissioner to the army of the North; and he was the *élégant* which Biot describes his friend to have been; but this was, of course, known to Biot. It may be surmised that the person really was the colleague of Robespierre, who, knowing that the power he had shown would necessitate the inference that he was very high in the state, and render his detection easy, chose to give his real name, but also to hint that further acquaintance would be inconvenient, by giving a wrong address. He was guillotined in July 1794, so that Biot, enfeebled by illness, probably had no opportunity of seeing him in public.

Biot was admitted into the school of *Ponts et Chaussées*, and into the Polytechnic School at its opening. He formed the acquaintance of Poisson, and the two became the favourite pupils of Monge. But Biot, Malus, and some others who had smelt powder, took part in the insurrection of October 1795, the suppression of which by grape-shot was the first very notorious achievement of Napoleon Bonaparte. Biot found refuge at Melun; but the names of the insurgent students were known, and they would have been expelled from the Polytechnic School if Monge had not interfered by the declaration that they were among his best pupils, and that if they

were dismissed he would retire with them. Monge was more than once the protector of the school. The Emperor, when he gained this title, felt strongly that the students were his enemies, and seems to have meditated their dispersion. "We had work enough," said Monge to him, "to make them republicans; give us a little time to form them into monarchists: you yourself must agree that you have turned that corner rather sharply." Napoleon did nothing: and he lived to call the school the goose which laid him the golden eggs.

Biot's next step in life was to a chair of mathematics at Beauvais. At this place he gained the acquaintance and correspondence of Laplace by an offer to correct the sheets of the '*Mécanique Céleste*.' He has given, in the *Journal des Savans*, an anecdote which is very honourable to Laplace. While at Beauvais he married the sister of his friend Brisson, whose family resided there. Neither had any money, either in possession or reversion; so that all except lawyers will share Biot's wonder when he found that the notary had contrived a contract of marriage twelve pages long. Madame Biot had been very well educated, and the little stories and dramas which she wrote for her children were celebrated in her circle. She learnt German in order that her husband, at the desire of Berthollet, might publish a French edition of Fischer's work on physics; but the actual translation, watched of course by her husband, was her own. The first edition was published in 1805. In 1799 Biot was appointed an examiner of the Polytechnic School; in 1800 he was removed to Paris as Professor of Physics at the Collège de France, and was made an associate of the Institute, of which he became a member in 1803. The other dates which we ought to give are as follows. He was appointed, with Arago, to the continuation of the measure of the meridian, in August 1806; with Mathieu, to determine the pendulum at Bordeaux, August 1808. He became editor of the *Journal des Savants*, May 1816. He went to Scotland and the Shetland Islands for the measurement of the pendulum in 1817; to Dunkirk, with Arago, to act in concert with an English commission for the determination of the latitude, in 1818; to Illyria and the Balearic Islands, for the pendulum, and to Spain for the repetition of measures connected with the great survey, in 1824-25. He was made a Foreign Member of this Society in

1815, and obtained the Copley Medal in 1840. He died at Paris, February 3, 1862.

The other dates, &c. of his life will be found, given by M. Lefort (the son of his daughter's daughter), in the '*Nouvelles Annales de Mathématiques*,' 2nd series, vol. i. The list of his writings, associated and separate, is under 477 heads; and this list, says the collector, is certainly incomplete. Of his separate works should be especially mentioned the '*Astronomie Physique*,' 1st ed., 1805; 2nd, in 3 vols., 1810-11; 3rd, in 5 vols., 1841-57; the '*Traité de Physique Expérimentale*,' 4 vols., 1816; the '*Précis*' of the same, 1st ed., 1817; 3rd, in 2 vols., 1824; '*Recueil d'Observations Géodésiques*' (vol. iv. of the '*Base du Système Métrique*'), 4to, 1821; the edition (in conjunction with M. Lefort) of the '*Commercium Epistolicum*,' &c., with additions, 4to, 1856. The works on Indian and Chinese astronomy can hardly be given apart, without the writings on the same subject in the journals.

How completely Biot was devoted to his occupations sufficiently appears. The indomitable energy of his character was associated with a strong feeling of personal independence. With the pride of a republican he refused, before his election to the Academy of Sciences, to pay the usual visits of ceremony to his future colleagues. This he afterwards regretted; and, as a kind of expiation, he made it a rule, until at last his friends insisted that he should spare his extreme old age the fatigue, to pay a visit to every new member of the Academy, so soon as his election was made certain.

In 1803, his son Edward was born. This son, after a respectable career in science and engineering, took a dislike to such pursuits, and applied himself to literature, and especially to the study of Chinese. He died in 1850, a member of the Academy of Inscriptions, in which he found himself the colleague of his father; for it should be noted, as a thing which is, we believe, unique, that Biot died a member of three of the four academies, being also elected to the Académie Française in 1856. The mother survived her son two years; and these losses were the great misfortunes of the father's life.

The name of Arago will always be associated with that of Biot. Arago in his early youth (he was but twenty-four years old when he gained his place at the Institute, after his return from captivity

at Algiers) had distinguished himself to an extent which induced Biot to make it almost a condition that the young man should be appointed his assistant, before he would undertake the conduct of the survey. When a place in the astronomical section of the Institute became vacant, Poisson was thought of as a successor to Lalande, with every chance of success. Biot protested, and urged strongly to both Lagrange and Laplace, that the astronomer ought to be a person conversant with astronomy, and that Poisson's future chair ought to be one of geometry. Lagrange gave way at once—"Vous avez raison," he said, "*c'est la lunette qui fait l'astronome.*" Laplace was harder to convince, but yielded at last.

In 1809 Biot obtained those apartments in the Collège de France which he occupied with hardly any intermission until his death. We have heard it said that he never left Paris for one single night during fifty years: this is probably not literally true, but is certainly very near it. In the same year (April) an imperial decree named him professor of astronomy in the new University then founded. Biot had not been an Imperialist; and the appointment was a free testimony to his merit. In 1804 he had endeavoured to prevent the Institute from expressing an opinion in favour of the new *régime*, on the ground that a scientific body should not meddle with politics: this opinion he always maintained. The police were well aware that he had assisted Benjamin Constant, Andrieu, and perhaps other frequenters of the house of Madame de Staël, in the composition of a satirical piece which had great success in such private circulation as could be safely given. Fouché had charged Laplace to tell his young friend to be a little less witty and a little more prudent. Biot, as might be expected, obtained no very great patronage from the Emperor. He had a turn for dry satire, which, under very effective restraint, is visible in his controversial writings; and he had the mode of delivering a sarcasm which tells. In 1800, Roederer, then high in the direction of public instruction, paid a visit to the Collège de France, and, surrounded by the professors, read them a lecture on their functions, recommended practice in preference to theory, and pointed out geometry and algebra as not good for much. "*Cependant,*" quietly remarked Biot, "*la géométrie a du bon pour l'arpentage,*" to which the other was unfortunate enough to assent in a manner which showed he did not understand

the answer. The amusement which this excited led Laplace to tell the story to the First Consul, among whose few objects of reverence the mathematics stood very high. Roederer accordingly had to encounter one of those *bourrasques* by which Napoleon is so well known. "You are a pretty *ignoramus* not to know that mathematics is the root of human knowledge. The young man served you right when he turned you into ridicule; and you could not even see what he was at."

If such anecdotes appear to be unusual in our notices, it may be remembered that these accompaniments would, in most cases, be of too recent a character. We insert nothing but what is more than half a century old, and we proceed to a few words on Biot's scientific life.

Over and above separate works, fifteen in number, the scientific life of Biot is recorded in 60 articles of the *Journal Philomathique*, 119 of the *Comptes Rendus*, 3 of the *Journal of the Polytechnic School*, 8 of the *Connaissance des Temps*, 41 of the *Annales de Chimie, &c.*, 22 of the *Memoirs of the Academy*, 1 of the *Savans Etrangers*, 83 of the *Journal des Savans*; and of accounts and criticisms, 37 in the *Moniteur Universel*, 35 in the *Mercur de France*, 1 in the *Journal des Débats*, 5 in the *Journal des Mines*, with 23 articles in the *Biographie Universelle*, 9 in the *Mémoires, &c. d'Arcueil*, 1 in the *Academy of Inscriptions*, 2 in the *Revue Britannique*, 6 in the *Revue ou décade Philosophique, &c.*, and 8 in the *Nouvelles Annales du Muséum d'Histoire Naturelle*. In this large mass of results the author appears as an observer and experimenter, as a critic and historian, and as a teacher and elementary writer.

As an astronomical and geodetical observer, Biot has long had his place in history; to discuss that place would require the discussion of critics, historians, and subsequent observers. As an experimenter, we cannot undertake to describe that long train of which Professor Forbes, in his elaborate sixth dissertation of the '*Encyclopædia Britannica*,' says "the number and variety of his experiments and writings almost baffles enumeration." There is no part of physics into which he did not carry his researches; but of all he was most devoted to optics. Here the point which has been most signalized by historical writers is the effect of the rotatory action of fluids, to

which he attended for forty years. All acknowledge the sagacity, perseverance, and honesty which are conspicuous in this prominent part of Biot's life, as in others.

As a critic and historian, Biot's field of labour was even wider than that of his life as an experimenter and observer. Had he published nothing whatever except his papers on Egyptian, Hindoo, and Chinese astronomy, he would have been known as an inquirer the amount of whose labours was fully equal to that of several whose reputation is entirely founded upon oriental astronomy. Had he produced nothing except the long series of articles on contemporary science and history of science which adorns the *Journal des Savans*, he would have been remarkable as the most continuous and varied scientific critic of his time. And in all these articles there is a close and discriminating production of the whole subject, relieved by legitimate satire, and by a tone of occasional pleasantry which is the true vehicle of certain parts of good criticism. Three volumes of '*Mélanges Scientifiques et Littéraires*' were published in 1858; but it may be hoped that this will be superseded by a more complete reprint.

It is natural that a notice in these pages should make allusion to Biot's part in a controversy which, more than any other, concerns this Society: we mean the never-ending question of Newton and his opponents. From the time when the life of Newton appeared in the '*Biographie Universelle*,' its author was what we may here call the chief of the opposite party. His views were strong, and ably supported; his mode of opposition was fair and downright. Biot was one of those disputants who cannot fail to forward sound conclusion, take which side they may.

As an elementary writer, this country is under especial obligations to Biot. In 1816, just after the termination of the long struggle which had isolated Great Britain from the continent, he produced those treatises on physics, full and abridged, which laid all the recent physical improvements before those who could not have sought them in scattered organs of announcement. Very many of those whose youth belongs to this period will remember Biot's '*Traité*' and especially his '*Précis*,' as the first sources of their acquaintance with modern experimental methods and results. The treatise on astronomy, not so much known in this country, filled up a void

which had been left open in the large mathematical work of Delambre.

It is not often that a death at the age of eighty-eight leaves a blank in the scientific world; but this must be said of Biot. To the end of his long life he was in perpetual activity. A volume on Indian and Chinese astronomy appeared in 1861, closing the list which began with "Elements of Arithmetic," prefixed to Clairaut's 'Algebra,' in 1797.

WILLIAM BORRER, Esq., the eldest of the three sons of William Borrer, Esq., of Parkyns-manor, Hurstpierpoint, was born at Henfield in Sussex on the 13th of June 1781. He passed his long life in the country, discharging the duties incident to a landed proprietor and county magistrate, and earning the respect and attachment of his neighbourhood for his well-considered acts of local beneficence. Amidst his rural occupations Mr. Borrer found ample scope for the pursuit of botany, to which he was enthusiastically devoted, and earned for himself a considerable reputation among British botanists for his extensive and accurate knowledge of indigenous plants. To the great repertory of that species of knowledge, the 'English Botany,' and especially to the Supplement of that work, he contributed valuable materials; and, in association with his friend Mr. Dawson Turner, commenced a 'History of British Lichens,' which, however, was stopped in its progress by the death of the printer and other untoward circumstances. After lying dormant for a quarter of a century, the fragment of this work actually printed was brought out by Mr. Turner for private circulation, and mainly, as he expresses himself, that it might serve as a monument of Mr. Borrer's industry, ability, and profound knowledge of the family of plants to which it refers.

Mr. Borrer was elected into the Royal Society in 1835. He was also a Fellow of the Linnean Society and of the Wernerian Natural History Society of Edinburgh. He died on the 10th of January 1862.

The life of our late President, SIR BENJAMIN COLLINS BRODIE, Baronet, Serjeant-Surgeon to the Queen, has not been ended long enough to allow even those who are best acquainted with it, fully or, perhaps, correctly to estimate its precise value.

There is no profession where a man may in his lifetime be so distinguished, and leave behind so slight record of his life, as the profession of Medicine or of Surgery. With the death of the man there perishes in such case a vast amount of personal skill and observation, which, being unwritten, and indeed not capable of being written, can be amassed again only by the combination of similar talent, opportunity, and industry in another individual. Nor is even this always possible. There are epochs in human knowledge as in human affairs; and a man may so turn to account the peculiar circumstances of his epoch as to attain not only just celebrity, but a certain masterly power which he could not have attained without such a combination of events.

Such considerations must be present to our minds if we would form a correct estimate of Sir Benjamin Brodie. He furnishes a rare instance of a man who, having in early life had no particular advantages on the one hand, nor any great drawbacks on the other, obtained the highest place in a learned profession, as well as the greatest honour which English Science can bestow on a scientific man—the Presidency of the Royal Society.

A brief record of his progress, considered not only as that of an adept in science and a master in the noblest of arts, but as a man, will be well worthy a place in the ‘Proceedings’ of the Royal Society—a Society which is not only directly concerned in advancing human knowledge for its own sake, but indirectly also in interesting the most complete minds in the advancement of that knowledge. It must set a special value on the example of one who proved to demonstration, by a long and admirable career, that devotion to purely scientific pursuits, and a deep interest in all that concerns scientific progress, may coexist with eminent professional skill, with a philanthropic spirit, and an enlarged religious mind.

Benjamin Collins Brodie was born in the year 1783, at Winterslow, in the county of Wilts. His father was Rector of the parish. He had three brothers and two sisters, being himself the fourth child. His father was a man of energy and ability, and brought both to bear on the education of his children, in whose well-being he took the deepest interest. He instructed them himself; by his own example he trained up his children in habits of industry; above all he taught them in many ways from their earliest years to think and

act for themselves. Sir Benjamin would often state the great advantage he had derived from being called upon at the age of sixteen to join in managing a volunteer corps at the period of the first anticipated French invasion in 1798. The difficulties of communication, and the whole condition of the country, made such a task more arduous, and therefore more instructive, than a young man would find it at this day.

But this occupation did not distract him from those studies which there has been a tendency of late years to decry. In after life he often looked back with satisfaction to the labour he had bestowed on committing to memory passages of the Greek and Latin authors, and of our own chief poets; he would tell how, in long professional journeys, before the days of railroads, he had been cheered by the recital of them; and he would point out how he believed the imaginative faculty, so essential to any great artist, be his art what it may, had been disciplined as well as fostered by early industry in ordinary classical studies.

Being naturally, or from a sense of duty, a studious boy, he, of his own accord, amassed, in leisure hours spent in his father's library, a great variety of knowledge; and he even then acquired a taste for those psychological speculations which shed a genial glow over his later days, when the labour of life was over and when his mind dwelt with serene delight on the contemplation of those higher qualities which are the peculiar property of man, and which are strengthened or impaired according to the use made of them by each possessor.

Thus prepared, in the autumn of 1801 our future President entered such a school of medicine as sixty years ago London afforded. He had no special predilection for either medicine or physical science. The arrangements of his family, rather than an active choice, led him to adopt his father's suggestions as to his future profession. He had already acquired a taste for work as such, he knew that he had to strive for his own maintenance, and forthwith betook himself with rational zeal to the selected study. Had his lot engaged him in the study of some other subject-matter than medicine, that other subject would assuredly have been equally mastered by the same steady grasp, and elucidated by the same clear mind.

It is not easy for one conversant only with the existing appliances for medical instruction to appreciate the circumstances of a lad who

was sent to walk the hospitals in 1801. At present the work of a student is regulated, or over-regulated—is divided into many subjects, so many lectures being assigned to each. There is the first year's work and the second year's work, under an arrangement so systematic that the young student, whatever be his capacities or his previous training, is allowed only to join the stream, and therein is hurried on too fast if slow of apprehension, or wearied by useless attendances if quick beyond the average. The freest scope was then given to the able and well-disposed—too free by far for the careless or dissolute. Brodie, nurtured hitherto only by his father's polished care, the companion of the Rector's walks, the popular subaltern of a volunteer corps in a county far from the metropolis, reaches London, and is thrown at once upon opportunities so ruinous to some, so good for him. He was not without good advice as to his future course. Dr. Denman, Dr. Baillie, and Sir Richard Croft, eminent and admirable men, were connected with his family by marriage. He was sent to Abernethy's lectures on anatomy. If in these lectures details were absent, the deficiency was compensated for tenfold by the genius and heart of the man. Abernethy gave to his pupils what the living teacher can best give, a living interest in their work. The Student was fascinated. He determined on following the profession recommended by the example of that popular Surgeon; for he found that he could not be a Physician without a university degree; and this had not been provided for him.

Brodie's character and training must have made parts of his early medical studies irksome, and some of his companions distasteful to him—though in this he only shared the lot of other right-minded youths who come from virtuous homes. Nor can it be doubted that the shock which he must have experienced sixty years ago at the low education and unformed habits of mind of some of his class companions, helped to implant in him that strong, it may be said parental concern in all that affects the best interests of medical students, which characterized him up to the last days of his long and active life. It is, however, true that, devoted, as his subsequent career proves, to his purely professional studies, he was not dependent on the medical school for his companions. His literary tastes did not desert him. He studied in this year the writings of various masters in mental philosophy—of Dugald Stewart, Berkeley,

Locke. He belonged to a literary debating Society, of which Lord Campbell, then young, was also a member; and as evidence of the subjects there occupying his mind, it may be stated that he read essays on the advantages to be derived from metaphysical inquiries, and on the supposed modern discoveries which are to be found forestalled in Pliny's 'Natural History.' This comprehensive view of the subjects, both proper and useful in the formation of a large professional mind, was never altered. In the most active period of his life he is known to have examined, with care and interest, the scientific papers in the early volumes of the 'Transactions' of this Society; and still later to have increased his acquaintance with the older medical and surgical writers.

In this year and the following he dissected at Wilson's School of Anatomy, worked at pharmacy in the open shop of an apothecary, and did not enter St. George's Hospital till 1803.

At the Hospital the youth immediately ripened into the man. Though he would even then look wistfully at literary pursuits, and kept up constant intercourse with literary men, he here first learned to apply the mental instrument, which hitherto he had only whetted, to the material on which for half a century it was henceforward to work. He first watched his teachers as they played before him the solemn and weighty game of Therapeutics, "life being the stakes;" and then, unceasingly in the wards, he studied by himself with avidity the accidents and injuries to the human frame which he had pledged himself henceforward to strive to alleviate or avert. He wrote full notes of what he observed. They who know his terse mode of expression, know how clearly he thought, how exactly, how simply he recorded what is essential, and how he discarded everything that is irrelevant.

Though so intent on clinical study, his well-poised mind did not relax its hold on scientific work. He seized now the opportunity of teaching anatomy, and continued for many years to employ his powers in this manner. He attended few lectures; there were, happily for him, few to attend. He read few professional books; there were not many worth study. He dissected, observed, recorded, taught. He worked at anatomy for and with Sir Everard Home, not only as it bore on surgical practice, but as a science, pursuing it (as Hunter had done) into higher physiological questions, and into the

comparison of organ and function throughout the animal series. Here he received much help from Mr. Clift, the faithful and excellent Conservator of Hunter's preparations.

It was about 1806 that his connexion with the Fellows of the Royal Society may be said to have begun. Through Home he made the acquaintance of Sir Joseph Banks, and (as the few who remember the liberality and kindness of that illustrious and useful man will well understand) met in his society the galaxy of scientific persons who early in this century flocked daily to his residence in Soho Square. In after days he used to refer to the advantage he had derived from his early acquaintance with Davy, Hatchett, Wollaston, Brown (the botanist), Dryander, Dr. Young, and others. He had been always shy, and was still nervous; modest, yet not without ambition: as he listened to the discourse of these men, and admired the consummate fitness of Sir Joseph Banks for his high station, he probably little thought that he would himself be called upon at a future day to occupy the same distinguished post.

By these several means he thus early gained a complete appreciation of what was needed to understand the nature of the diseases which oppress mankind, of the relative importance of clinical observation, pure science, and philosophical culture, in procuring alleviation of physical suffering. One can imagine the sadness, the almost bitterness of spirit which a man so disciplined in youth must have felt when, full of years and rich in vast experience, he felt himself called upon to leave as one of his last legacies to his countrymen his manly answer* to some of the ill-grounded fallacies which fashion supports under the guise of medicine improved and reformed.

In 1808, at the age of not quite twenty-five, he became Assistant Surgeon to St. George's Hospital; and he continued in the direct service of the hospital for full thirty years. The absence of one of his seniors at once threw the charge of many in-patients on his hands. On these he bestowed the most assiduous care, and lectured on the most important cases. He had declined on a former occasion to give lectures on surgery, because he could have only given second-hand, or book knowledge. But he now was able to draw his pictures from the life; he began not only to lecture in the hospital

* *Frazer's Magazine*, September 1861. Consult also *Quarterly Review*, December 1842.

clinically, but, with Mr. Wilson, in Windmill Street, to teach systematic surgery; and he continued to do so for nearly twenty years. His mode of instruction was then more peculiar than it would be now. His object was, as Abernethy's had been, not to gain applause, but to teach the pupils. He found this could not be done by reading out his lectures; and he soon accustomed himself, as all great teachers do, to pour forth his knowledge, previously arranged and digested it is true, but flowing at the moment spontaneously and unconstrained.

At this time (1810) his Anatomical Lectures became more frequent; and he was engaged in preparing his work for the day following till three or four in the morning. When not so engaged, he sought instruction and recreation with his literary and other friends; and, strange as it may seem to those who do not see the bearing of scientific study on practical work, he continued his researches on philosophical anatomy with Clift and Home. He also undertook some original physiological investigations, the results of which were communicated to the Royal Society, he having been elected a Fellow in 1810. The object of these communications deserves consideration. It has been remarked that it is an instinct of genius not only to suggest what work can, but what work cannot be attempted with advantage,—in other words, that intellectual efforts are not made by great minds except in cases when they will succeed. Brodie's physiological researches "On the Influence of the Brain on the Action of the Heart, and on the Generation of Animal Heat," were made in 1811, fifty years before his death. His mind was keenly alive, as we have seen, to the value of purely scientific research, without any regard to the immediate utility (so called) of the inquiry. On the other hand, the relief of suffering and the prevention of disease were the cynosure of his life. The four important essays which appear in our Transactions—viz., the one just alluded to, with its sequel (published in 1812), and two on the "Mode in which Death is produced by certain Poisons" (one printed in 1811 and the other in 1812)—all give a clue to the large views of the young surgeon. He goes straight to the cardinal points to be noted in the apparatus for the maintenance of life, and inquires into some of the crucial instances in which death is rapidly produced. The mutual relation between the nervous system, which is the organic differentia of

animals, and the circulatory apparatus which gives the basic conditions of nutrition in the higher animals, occupy his mind in the first two Essays. In the second he was aiming at the solution of one part of the question of questions for physiologists, how poisons operate on vital organs so as to produce death. These, his first papers, were composed with great clearness, and based on well-devised experiments. They do not exhaust subjects then only opening; for they have both been carried forward by various able inquirers in the half century that has now elapsed since he wrote them. But Brodie proved the correctness of the opinion advanced by Bichat and Cruickshank, that the cessation of the heart's action depends, not directly on abstraction of the influence of the brain, but on the cessation of respiration; and he showed that, to some extent (though to what extent and in what way is not even now certain), the maintenance of animal heat is under the influence of the nervous system. The most important of his experiments on poisons were those which he made with the Woorara. They showed that the poison is first absorbed through the blood-vessels, and so acts on the nervous system; that in consequence of the paralysis thence ensuing, the respiratory organs cease to act; and that the failure of respiration leads to cessation of the heart's action, and suppression of the circulation. Accordingly it was further shown that if respiration be artificially performed, the heart will continue to act, and the blood to circulate; and that if the process be carried on for a sufficient length of time, in some instances the brain will recover, and life will be maintained without perceptible impairment.

Brodie appears also to have been the first to show that the Antiar poison of Java operates by primarily arresting the action of the heart, and that it thus offers a remarkable contrast to the class of poisons to which the Woorara belongs.

The Copley Medal was awarded to Mr. Brodie for the former set of observations in the year 1811.

It is noteworthy that at this period he was an active member of two small societies, to one of which, the Animal Chemistry Club, Humphry Davy belonged, while of the other, the Society for the Promotion of Medical and Chirurgical Knowledge, John Hunter had been one of the original members. He began about this period to be a frequent visitor at Holland House; and he has often been heard to

speak of the benefit he had derived from the society of the great statesmen, literary men, artists, and other eminent persons whom he there met.

In the year 1813 he delivered the Croonian Lecture on the effect of the Nerves on the Heart and on the involuntary Muscles. With characteristic modesty and his usual thoroughness of purpose, he requested that, as the subject required further inquiry, it might not be printed. His mind was still bent on the significance of the higher vital phenomena in animals; for in the following year (1814) another paper was printed in our Transactions, "On the Influence of the Nerves of the Eighth Pair on the Secretions of the Stomach."

In 1816 he instituted experiments on animals to determine the effect of the bile on chylification. His conclusion, that it is essential to that process, has been since disputed; but it is still probable that the earlier investigator was as near to the truth as his critics. He afterwards lectured on Comparative Anatomy for four years at the College of Surgeons, from 1819 to 1823, bringing to bear the stores of knowledge he had previously acquired when working with Mr. Clift and Sir Everard Home.

With these last lectures his active physiological studies must be considered to have closed. But so trained was he in scientific pursuits, that his eager interest in anatomical and physiological questions, and in the philosophy of his art, never left him.

Henceforward not only his duties at St. George's Hospital, and to private patients, but also his inclination led him to devote his whole powers of investigation to those alterations in the living body which constitute disease. The unsatisfactory state of surgical knowledge, and therefore of practice, in regard to affections of the joints, attracted his attention, and he at once hit on a principle which was a guiding maxim to him in after life. Finding how little could be made out of a disease by dissection of the parts where organic alteration was far advanced, he used to examine the joints of those who had died of other diseases, in order to find the first traces of future injury. At the end of two years' assiduous inquiry, for which he had great opportunities, he felt at liberty to communicate to the Medico-Chirurgical Society some observations on the question*. To these he added in the following year†. These papers form the basis of

* Med. Chir. Trans. vol. iv.

† Ibid. vol. v.

his invaluable work on Diseases of the Joints. His nice discrimination of the tissues affected, and of the exact value of pain in the joints as evidence of organic disease, has altogether altered the practice in such cases, and has tended greatly to reduce the number of amputations. What a reflection for a man at the close of life!

To pursue further the details of his active professional life belongs to the purely Medical biographer. Here it need only be said that he published, besides the work on Diseases of the Joints, three other surgical volumes, and contributed numerous papers to the 'Transactions of the Royal Medical and Chirurgical Society,' and that he did not cease to lecture on surgery at St. George's Hospital, with more or less frequency, till 1843, his instruction being sought with avidity, for it was simple and drawn from the life. None who heard him can forget the graphic, yet artless, manner in which, sitting at his ease, he used to describe minutely what he had himself seen and done under circumstances of difficulty, and what under like circumstances he would again do, or would avoid. His instructions were illustrated by valuable pathological dissections which during many years he had amassed, and which he gave during his lifetime to his Hospital.

The threefold character of scientific man, author, and surgeon, thus early formed, was maintained till his sight failed shortly before his death. A few words must be said on his qualities in each respect.

As a scientific man his several works were marked by distinctness of purpose, adaptation of means to end, and rigid determination to conclude no more than observation completely justified. His relations to other scientific men may be best understood by recalling the just, courteous, and candid manner in which he conducted the business of the various societies whenever he was called upon to preside, and the lucidity with which he kept the main points before a meeting. He always advocated and supported open discussion, and in this way did good service to the Royal Society.

As an author, he was not voluminous; nor did he speak much in public. He discarded all arts of style, aiming solely at precision and brevity: he wrote as he spoke, only when duty called, or when there was something which he believed he could write or say well. He was well versed in the literature of his profession and of those sciences which interested him; but he had not much love for books as instructors in his calling, because he knew that observation and

reflection were of more service than reading for the formation of the scientific mind, and original knowledge more valuable than that which is secondhand. He himself used books and so advised younger men to use them rather to gain the knowledge of what had been done, and as an aid towards actual observation and reflection, than thereby to educate themselves. His belief that observation, practice, and thought are the chiefest means for self-training in science partly accounts for the brevity of his published works, and greatly enhances their value.

As a surgeon, he was remarkable from early life for the scrupulous care which he bestowed on the investigation of the cases entrusted to him. This obtained for him in a few years rare quickness as well as precision in the formation of his opinion. When Sir Astley Cooper's practice declined, he was for many years extensively called upon to act as an operator. He excelled in that department of his art; for he had every requisite for success—knowledge, coolness, and the quick imagination which prepares for almost all possible emergencies that can occur, and suggests at once expedients when any come unforeseen. He did not, however, give the highest place to this part of his professional duties; for, in an occupation in which intellectual power and practical skill are combined, he valued those parts the most in which the most intellectual power is evoked. At the same time he was ready and ingenious in mechanical contrivances, and had the neatness and the method so requisite for a good surgeon. It was characteristic of his mind, that, among a few valuable lectures on some important subjects which he collected into a volume, he has given a place to one on Corns and Bunions—showing that in his judgment a small evil which can produce great annoyance requires as much consideration in its turn as more serious disorders. In truth, as the great aim of his life was to prevent or to cure disease, that which was curable, though trifling, would in one sense attract his notice more than that which was already irremediable. At the same time his difficulty in coming to the conclusion that there was nothing to be done, in even the gravest case, was a marked feature in his hopeful mind.

But the character of Brodie can be only properly considered as a whole. Neither as scientific man, nor as surgeon, nor as author was he so remarkable as he appears when viewed as he was—a complete man necessarily engaged in various callings. It was impossible to see him acting in any capacity without instinctively feeling that

there he would do his duty, and do it well. Nor could he be imagined in a false position. A gentleman, according to his own definition of that word, "he did to others that which he would desire to be done to him, respecting them as he respected himself." Simple in his manners, he gained confidence at once; accustomed to mix with the poorest in the hospital and with the noblest in their private abodes, he sympathized with the better qualities of each—valued all, and despised nothing but moral meanness. Though as a boy he was retiring and modest, he was happy in the company of older persons, and, as he grew older, loved in his turn to help the young. "I hear you are ill," he wrote once in the zenith of his life to a hospital student of whom he did not then know much; "no one will take better care of you than I; come to my country house till you are well;" and the student stayed there two months. He was thought by some reserved—he was modest; by others hasty—he valued time, and could not give to trifles that which belonged to real suffering; he was sometimes thought impatient, when his quick glance had already told him more than the patient could either describe or understand. Unconscious of self, of strong common sense, confident of his ground or not entering thereon, seeing in every direction, modest, just, sympathetic, he lived for one great end—the lessening of disease. For this object no labour was too great, no patience too long, no science too difficult. He felt indeed (to use his own words on the day of his election as President) "his happiness to be in a life of *Exertion*." As a professional man he valued science because it so often points the way to that which is practically useful to man; but as a scientific man his one object was the Truth, which he pursued for its own sake wholly irrespective of any other reward which might or might not follow on discovery. He had not the common faults of common men, for he had not their objects, nor their instinct for ease, nor their prejudices: though he became rich, he had not unduly sought riches; though he was greatly distinguished, he had not desired fame; he was beloved, not having courted popularity. What he was himself, that he allowed other men to be, till he found them otherwise. He saw weak points in his profession, but he saw them as the débris from the mountains of knowledge and of wisdom, of benevolence and of self-denial, of old traditional skill ever growing and always purifying,—those eternal structures on which are founded

true Surgery and Medicine. If ever he was bitter in society, it was when they were undervalued ; if ever sarcastic, it was when the ignorant dared assume to judge them.

A light is thus thrown on his even career of uniform progress. Training his powers from youth upwards, by linguistic and literary studies, by scientific pursuits, by the diligent practice of his art, by mixing with men, he brought to bear on the multifarious questions which come before a great master of healing, a mind alike accustomed to acquire and to communicate, a temper made gentle by considerate kindness, a tact that became all but unerring from his perfect integrity. He saw that every material science conduces to the well-being of man ; he would countenance all, and yet be distracted by none. He knew the value of worldly influence, of rank, of station when rightly used ; he sought none, deferred excessively to none ; but he respected all who, having them, used them wisely, and accepted what came to himself unasked, gave his own freely to all who needed, and sought help from no one but for public ends.

A few words only may be added on the inner life of his later days. Those who knew him only as a man of business would little suspect the playful humour which sparkled by his fireside—the fund of anecdote, the harmless wit—the simple pleasures of his country walk. Some, who knew these, might not have imagined another and deeper current which flowed unheard when neither the care of his patients nor his literary pursuits or memories engaged his mind. He who from his early professional life sat down every night, his work ended, his notes entered, his next day ordered, to ask what could have been better done today and what case otherwise managed, was not one to reach threescore years and ten without a keen onward gaze on the entire destiny of man. Yet he who realized in his profession the answer of Trophilus the Ephesian to the question, *Who is a perfect physician?*—“he who distinguishes between what can and what cannot be done”—such a man would not dogmatize on what cannot be known, nor would he, so humble, attempt to scan the Infinite. But his nature yearned for some better thing to come ; and yearning, it became satisfied. He had for many years thought and conversed among his friends on facts he had noted in relation to our mental organization. In the year 1854, he published anonymously a volume on *Psychological Inquiries*. This was

followed by a second, with his name, in 1862. These volumes contain little that is actually new to professed psychologists; but they are the conclusions of one who had thought and worked—variously, consistently, practically. Living not in the closet, but hearing the opinions of every party and of every kind of men—liberal in all his views—without prejudice, and ever open to conviction, yet tinged with a general dislike to change as such,—he tells in these volumes what he had concluded concerning the mind of man—its laws, its discipline, its future state. They therefore who value such a character will prize these writings for qualities other than the novelties they may contain. It will be remembered that the scientific inquiries of his early life related to the influence of the nervous system on certain parts of the animal economy. To the ordinary physiologist this may be a purely material question; to him it was not so. In middle life he said to a friend, speaking of his lectures on the Comparative Anatomy of the Brain, “the complexity of the mechanism of the higher brains is enough to make one giddy to think of it.” A fortnight before his death he talked to the same person of this mysterious link between our consciousness and our visible material organization, descanting with keen interest on the relations between mind and body, and the mutual reactions of one on the other. As he then lay on his sofa almost for the last time, in great pain, having scarce for many months seen the outer world which had been so much to him, and to which he had been so much, he spoke freely of our ignorance as to many things which it would be a joy to know—of the existence of evil—of the too little attention which philosophers had paid to the terrible nature of physical pain—of the future state. So gathering up the teachings of his useful life, and still, as ever, looking forward, he waited its close. Not many days after this he breathed his last, at Broome Park, on October 21, 1862, in possession of the full calm power of his disciplined mind to within a few hours of his death.

Such was our late President. They who knew and honoured him may excuse, while they accept, a delineation too feeble for so complete a man. In the quality of his mind he was not unlike the most eminent of his contemporaries, Arthur Duke of Wellington. Those who did not know him, and who do not appreciate the power requisite to make such a master in medicine as he was, may

be surprised at the comparison. Yet our great soldier might have accepted the illustration without dissatisfaction. Whatever art Brodie undertook, if he has been correctly drawn, he would have entirely mastered. The self-discipline of the strongest man can effect no more. The care with which the two men compassed every detail and surveyed every bearing of a large question, the quiet good sense, the steadiness of purpose, the readiness of wide professional knowledge in critical emergencies, were in each mind alike. The public and his profession esteemed Brodie as the first in his art. He advised three successive Sovereigns, and from one had the only other mark of esteem which a Sovereign can bestow—a Title. He was made a Corresponding Member of the French Institute in 1844, and received the Honorary Diploma in Civil Law from the University of Oxford in 1855. He was elected the President of the Royal Society in 1858, and became the first President of the Medical Council under the Act for regulating the Education and Registration of the Medical Profession; but he resigned both offices in two years, on account of the advancing failure of his eyes.

It remains to be recorded that in 1816 Mr. Brodie married the daughter of Serjeant Sellon, and survived her two years. By her he had issue two sons and a daughter. Of these, the eldest, the present possessor of the Baronetcy, like his father, received early in life one of the Medals of the Royal Society, and is now the distinguished Professor of Chemistry in the University of Oxford.

FRANCESCO CARLINI was born in Milan on the 7th of January 1783. His father, Carlo Giuseppe Carlini, a native of Cremona, was one of the librarians of the Brera, and was eminent as a Bibliographer. He died in 1789. His ancestors came, it is said, from Linz in Austria.

At an early age Francesco Carlini manifested a taste for astronomy, and was in the habit of making calculations for Oriani, Reggio, and Ccsaris, the astronomers of the Brera. In 1799 he was admitted to the Observatory as a pupil, was appointed one of the commissioners of weights and measures for the kingdom of Italy soon afterwards, and in 1804 was promoted to the rank of supernumerary astronomer. In 1803 he made observations of Pallas in opposition, and continued his observations of this and the other small planets up to 1816. Between 1814 and 1818 he constructed

tables of the equation of the centre, and the reduction to the ecliptic, of all the small planets then discovered. In 1804 he undertook the sole charge of calculating the *Effemeridi Astronomiche*, pronounced by Lindenau and Bohnenberger, in 1816, to be the best ephemeris in existence at that time. From 1802 to 1807 he took a share in the geodesic operations required for the construction of a map of Lombardy. These were carried on from 1788 to 1807 by the astronomers of the Brera, and afterwards by the French engineers.

A careful examination of the solar tables of Delambre, made in order to ascertain their fitness for use in calculating the *Effemeridi*, having revealed some serious errors, Carlini was induced to undertake a revision of them. Retaining the constants which Delambre had deduced from the observations of Bradley and Maskelyne, he recalculated the tables by a method of his own. In 1832 he published a new edition of the tables, based upon newer and more accurate elements. These tables were used till very recently for the calculation of the sun's place in the most celebrated *Ephemerides*.

Laplace, dissatisfied with the semiempirical basis on which the lunar theory rested, even after the publication of the '*Mécanique Céleste*,' suggested to the Institute, as the subject of the prize for 1820, the formation of lunar tables, by theory alone, as exact as those which up to that time had been constructed by theory and observation combined. As far back as in 1813 Plana and Carlini had resolved to construct a complete theory of the moon, subjecting all the inequalities to the laws of geometry, and had made considerable progress in their task, when the announcement of the programme of the Institute induced them to compete for the prize by sending in the results they had already obtained. By the decision of a commission, consisting of Laplace, Burkhardt, and Poisson, the prize was divided between Plana and Carlini, and Damoiseau. The principle on which their joint memoir rested, and which rendered it superior to all researches of earlier and many of later date, was this:—never to take from observation any constants that were not indispensably necessary for the solution of the problem. They adhered most rigorously to this condition, without which the analytical solution cannot be perfect. In the development of the various expressions in series, they retained the literal notation, giving an algebraical, not a numerical solution. This memoir was not published

at the time : afterwards Plana resumed it alone, developed it more completely, and published it in 1832, under the title "*Théorie du Mouvement de la Lune*," in three volumes quarto, a work which forms an epoch in the history of astronomy. In 1820 they published a joint memoir in reply to some objections to their theory raised by Laplace—and another on the lunar equation, having for its argument twice the difference between the longitude of the node and that of the perigee. Carlini next undertook the construction of lunar tables. These have been used up to the present time in computing the places of the moon for the *Effemeridi di Milano*. He afterwards investigated various points of the lunar theory, especially the remarkable inequality of the moon's mean motion, indicated by a comparison of ancient and modern observations, and produced, as Hansen proved in 1847, by the disturbing action of Venus. Of his "*Algoritmo del calcolo delle perturbazioni lunari*," intended as the commencement of a complete lunar theory, only the first chapter appeared in the 5th volume of the memoirs of the Istituto Lombardo.

Carlini's principal contributions to practical astronomy are :—"*Tables of astronomical refraction*" (1807); "*Computation of occultation of stars by the moon*" (1808); "*Tables for the reduction of circummeridian altitudes*," (1809); "*Tables for calculating the coefficient of the square of the time in the precession of stars*" (1819). He invented a method of finding the time and latitude by means of a telescope provided with a level and a micrometer, and applied it in Spain, where he went by order of the Government to observe the eclipse of the sun on the 18th of July, 1860.

Between 1821 and 1827 Carlini assisted in the measurement of the Italian portion of an arc of longitude extending from Bordeaux to the Adriatic. He made the requisite astronomical observations on the summit of Mont Colombier; determined the length of the seconds' pendulum on Mont Cenis; observed from Parma the gun-powder signals fired on Monte Cimone, and from Milan those fired on the summit of Monte Baldo. He also determined anew, with the aid of better instruments and improved methods of calculation, the latitudes of Mondovi and Andrate, the extremities of the arc measured by Beccaria. He found the sum of the deviations of the plumb-line to be about 48", and thus confirmed the accuracy of Beccaria's observations.

On the death of Angelo de Cesaris in 1832, Carlini was appointed Director of the Observatory of the Brera. He was a good analyst, understood five modern languages, was the author of various scientific biographies, and was one of the editors of the '*Biblioteca Italiana*' from 1826 to 1840.

The list of his writings appended to the notice of his life read before the Istituto Lombardo contains one hundred and forty-four titles. Most of these, exclusive of separate works, are to be found in the appendices to the '*Effemeridi astronomiche di Milano*' from 1805 to 1863, the '*Memorie dell' Istituto Lombardo-Veneto*,' the *Memorie*, *Atti*, and *Giornale dell' Istituto Lombardo*, the '*Biblioteca Italiana*,' the '*Memorie della Società Italiana*,' the '*Monatliche Correspondenz*' and '*Correspondance Astronomique*' of von Zach, and the '*Zeitschrift für Astronomie*' of von Lindenau and Bohnenberger.

Carlini presided for many years over the Istituto Lombardo-Veneto, afterwards the Istituto Lombardo, and was a member of the principal Italian Academies. He was foreign member of the Institute, of the Astronomical Society, and of the Academies of Vienna, Göttingen, and Berlin. The date of his election as foreign member of the Royal Society is 1832.

In 1832 Carlini married Gabriella Sabatelli, the daughter of an eminent artist. She survives him. He was amiable in private life, and of spotless character. He remained free from infirmity, either bodily or mental, up to the age of nearly eighty years, and was able to compute the elements of the second comet of 1862 only a month before his death, which occurred, after a short but painful illness, at Crodo in Ossola, on the 29th of August 1862. The foregoing particulars of his life and labours are extracted from a biographical notice read before the R. Istituto Lombardo, on the 8th December 1862, by his successor as Director of the Observatory of the Brera, G. V. Schiaparelli.

JAMES ORMISTON M'WILLIAM, M.D., was a native of Dalkeith in Scotland, and was educated in Edinburgh, where he obtained his medical degree from the University, and the diploma of Licentiate from the Royal College of Surgeons. In 1829 he entered the Navy, and, after serving for a time on a foreign station, attained the rank

of Surgeon, and was appointed to H.M.S. 'Scout,' stationed on the west coast of Africa. On that unhealthy station, so trying to young naval surgeons, he devoted himself most earnestly to his duties, and obtained the distinction of the Gold Medal instituted by the late Sir Gilbert Blane for special merit in the medical service of the navy.

On returning to England, after the ship's term of service had expired, Dr. M'William took advantage of his temporary liberation from duty to improve himself in professional and scientific knowledge, and more especially to make himself well acquainted with the principles and practical methods of ventilation, heating, and other arrangements for the preservation of health. This species of knowledge, together with the information he had acquired on the coast of Africa, peculiarly qualified him to superintend the fitting up of the three ships which were destined to proceed on a voyage up the Niger. His sound judgment, intrepid character, and medical experience of a tropical African climate, had already led to his being appointed chief medical officer of the Expedition.

This Expedition was undertaken by benevolent individuals, supported by a considerable Government grant, to plant an English colony in Central Africa, and to promote agriculture and honest trade among the natives, in the hope thereby to reclaim them from trafficking in slaves. The chief incidents of the ill-fated voyage are well known. In the summer of 1841 the three ships proceeded to the African coast, under the command of Captain Trotter, and, ascending one of the mouths of the Niger, reached the confluence of that river with the Chadda, 270 miles from the sea; but in the mean time malignant fever had broken out in the ships, and in a short time had prostrated both officers and crews to such an extent that first one of the vessels, and soon afterwards another, had to be sent back freighted with the sick of the expedition. The remaining ship, the 'Albert,' of which Dr. M'William was surgeon, continued her voyage fifty or sixty miles higher up the river, in the hope of reaching some less unhealthy region; but the sickness did not abate, some of the ship's company had died, and many more, including the commander and most of the officers, were lying helpless under the malady; so that Captain Trotter, confirmed as he was in his judgment by Dr. M'William, determined to abandon the enterprise, and

the 'Albert' followed her consorts back to the sea. By this time only two officers, Dr. M'William and Dr. Stanger, and one of the European seamen were left able for service. In this plight the return voyage was commenced, and, the one remaining sailor having also fallen ill, the navigation of the ship was left to the two medical officers, Stanger acting as engineer and M'William as steersman; and by their good management and gallant perseverance she reached the sea in safety.

After his return home, in 1842, Dr. M'William published the 'Medical History of the Niger Expedition,' which was well received; and some time afterwards he was sent on a special mission to the Cape de Verde Islands, to inquire into the origin of the yellow fever which had broken out at Boa Vista soon after the arrival of the 'Eclair.' After a most laborious investigation, Dr. M'William gave in to the authorities an able Report, in which he clearly established that the disease was communicable by infection, and had been imported by the 'Eclair.' This report was printed by order of Parliament.

In rather tardy recognition of his public services, Dr. M'William was in 1846 appointed Medical Officer to the Custom House, and in 1858 was made a Companion of the Civil Order of the Bath. He was elected a Fellow of the Royal Society in 1848, and a Fellow of the Royal College of Physicians in 1861. He was a most active member and promoter of the Epidemiological Society, of which he was Secretary, and to which he contributed many valuable papers. As a naval medical officer he was highly esteemed by his brethren, not only for his professional merit, but for his unceasing efforts to secure for them, and particularly for the junior members of the service, a rank and position more in accordance with the social standing of the medical profession in civil life.

Dr. M'William's active and useful career was terminated on the 4th of May 1862, in consequence of an injury of the brain, caused by a fall down a steep stair a few days before.

Rear-Admiral SIR JAMES CLARK ROSS was born in 1800, and died in April 1862. The incidents in the life of this great navigator and excellent man would doubtless furnish abundant matter for an interesting narrative; but here we must be contented with little more

than a bare indication of dates. In 1812 James Ross entered as a midshipman on board the 'Briseis,' commanded by his uncle, Captain (afterwards Sir John) Ross. In 1818 he accompanied his uncle in his first polar voyage, and between 1819 and 1827 he returned four times to the same seas under Parry. Again he accompanied his uncle in his Arctic voyages performed between 1829 and 1833. He conducted the scientific observations in these last-named expeditions; and it was while thus employed that he determined the situation of the North Magnetic Pole, in latitude $70^{\circ} 5' 17''$ and west longitude $96^{\circ} 45' 48''$. In 1834 he was raised to the rank of Captain, and in 1835 was sent out to Baffin's Bay to succour ice-bound whalers.

Captain James Ross's skill and experience as a magnetic observer led to his being employed, between 1836 and 1838, in a series of determinations of the magnetic declination and dip, and the intensity of the magnetic force over Great Britain and Ireland.

In 1839 he set out on his memorable Antarctic Expedition; and after making three voyages within the Antarctic Circle, reaching $78^{\circ} 10'$ of south latitude, greatly widening the known geography of the south polar regions, and gathering a rich harvest of observations in magnetism and other branches of terrestrial physics, he returned home after an absence of four years. In 1848 he sailed on the last of his many arduous voyages. It is well known that the direct purpose of this voyage—the discovery and relief of Franklin and his fellow sufferers—was unhappily not accomplished, but its Commander did not fail to render it profitable to science.

Sir James Ross received his knighthood in 1844. King Louis Philippe nominated him to the Legion of Honour. He was elected a Fellow of the Linnean Society in 1824, and of the Royal Society in 1848. He was also a Corresponding Member of the French Academy of Sciences, and belonged to various other foreign societies of note.

To this brief notice of the leading events of Sir James Ross's professional life, it will be incumbent on us to add a larger comment on his labours and achievements as a man of science; but as these have not yet been fully made known in their proper place, it is deemed advisable that such reference to them as it will be requisite to make should be postponed for the present. The great work

which especially deserves to have its merits prominently set forth is his magnetic survey of the Antarctic regions. This is justly held to be the greatest work of the kind ever performed, and it was undertaken at the special desire of the Royal Society and the British Association. An account of the magnetic observations made by Sir James Ross in the first and second of the three Antarctic voyages was published in the 'Philosophical Transactions' by his friend General Sabine; and it is hoped that the labours of the third voyage and the coordination of the three years' work will be laid before the Society in the next session. The completeness with which the great and hazardous enterprise was carried out renders a full exposition of what was accomplished all the more requisite for a just appreciation of the merits of its gallant and skilful conductor; and the propriety of waiting until this has been given will, it is conceived, be generally recognized.

EDWARD STANLEY, Esq., Surgeon Extraordinary to the Queen, and Surgeon to St. Bartholomew's Hospital, died suddenly, in one of the wards of that Institution, on the 24th of May 1862, at the age of seventy.

Mr. Stanley, after receiving his general education at Merchant Taylors' School, was, in 1808, apprenticed to Mr. Ramsden, at that time one of the Surgeons of St. Bartholomew's Hospital, on whose death he was transferred to Mr. Abernethy. To this great master the pupil soon recommended himself by his earnestness in study, and especially by his devotion to anatomy and pathology; and through their joint labours was created the Hospital Museum of Morbid Anatomy, to which Mr. Stanley especially contributed many preparations illustrative of diseases of the bones and joints. This important collection they afterwards liberally presented, as a gift, to the Hospital. Mr. Stanley's acquirements in anatomy, and his well-directed zeal in its pursuit, led to his appointment as Demonstrator, and, after holding that office for some years, he joined Mr. Abernethy in 1826 in lecturing on anatomy and physiology, and continued to discharge this duty after the death of his eminent colleague, until 1843. In the mean time he had been, in 1816, elected Assistant Surgeon, and twenty-two years later, Surgeon to the Hospital; and he continued in that office until 1861, when,

although in good health and full possession of his faculties, he considerably retired to make way for his juniors, and accepted the title of Honorary Consulting Surgeon offered him as an acknowledgment of his past services and a mark of respect for his honourable motives in resigning his duties. In 1858 he was appointed Surgeon Extraordinary to the Queen.

Mr. Stanley entered the Royal College of Surgeons in 1816; he became an active and industrious member of the Council and Court of Examiners, served the office of Hunterian Lecturer, and was twice elected President. He was of old standing among the Fellows of the Royal Medical and Chirurgical Society, and successively filled the offices of Secretary, Treasurer, and President. His election into the Royal Society was in 1840.

Mr. Stanley's principal work is his 'Treatise on Diseases of the Bones,' which appeared in 1849. While Demonstrator of Anatomy he published a 'Manual of Practical Anatomy,' which in its time was extensively used in the Anatomical Schools of this country; and in 1829 an 'Account of the Mode of performing the Lateral Operation of Lithotomy.' He also contributed twelve papers to the 'Medico-Chirurgical Transactions.'

MR. JAMES WALKER was born in 1781, at Falkirk, where he passed his childhood and received the rudiments of his education. He was afterwards sent to Glasgow, where he studied at the University and obtained distinction in Natural Philosophy and Mathematics. From that University he, in later years, received the honorary degree of Doctor of Laws.

In the year 1800 he came to London, and commenced the profession of Civil Engineer, under his uncle, Mr. Ralph Walker, at that time engaged in the construction of the West India Docks. He continued assistant to his uncle during the progress of that undertaking and during the completion of the East India Docks. In 1803 he was appointed Engineer of the Commercial and East India Roads, undertaken in order to open a more direct communication with the Docks and the eastern parts of London. These works were successfully carried out under his direction, and now form the great route to the extensive suburbs which have risen between London and Blackwall.

The successful completion of the East and West India Docks, and of the communications leading to these important dépôts, obtained for Mr. Walker the appointment of Engineer for the Commercial Docks, which, with all improvements and enlargements up to the present time, have been executed from the designs and under the direction of himself and his partner, Mr. Burges.

The satisfactory manner in which these works were accomplished led to other appointments under the public Boards, who, from that time to the day of his death, consulted Mr. Walker on every engineering work of importance. His numerous and important labours as a Civil Engineer, for the last forty years, are well known. Among the great works with which he was connected, we may indicate, as especially worthy of note, Vauxhall Bridge, the Victoria Bridge over the Clyde at Glasgow, the improvements of the river Clyde (which from the death of Mr. Telford up to a recent date were under Mr. Walker's direction), the great repairs of the Caledonian and Crinan Canals, the drainage of the Middle Level by a cut of thirty miles in length, the coffer-dams and river-wall of the new Houses of Parliament, the Netherton Tunnel and other important works carried out by the Birmingham Canal Navigation Company, the Pier and Harbour of Granton, the improvements of the Harbour at Belfast, and the Harbour works at Dover. All these and many others, such as the designs and execution of the Harbours of Refuge at Alderney, Dover, and Harwich, the Tyne Piers, and the completion of the Plymouth Breakwater, were under the direction and superintendence of Mr. Walker. To them may be added, what is perhaps the most lasting monument of his skill, the various Lighthouses of the Corporation of the Trinity House. The Bishop Rock Lighthouse, on the Scilly Islands, the erection of which was attended with peculiar difficulties successfully overcome by Mr. Walker, will rank with the foremost of the great structures of that class reared by Smeaton and by Stevenson.

Mr. Walker's sound judgment and high character as an Engineer caused him to be frequently consulted by the Corporation of the City of London on the various engineering works under their jurisdiction; among which may be named the City Sewers, the Navigation of the Thames, and the Thames Embankment. The

last-mentioned work was laid out by Mr. Walker, and his design has now been adopted under the designation of "Walker's line."

Thus, for more than half a century, did Mr. Walker indefatigably exercise his professional skill in works of public utility in all parts of the kingdom—works which have had no mean influence on the social and commercial progress of the country.

Mr. Walker was elected into the Royal Society in 1828; he cooperated with Mr. Telford in establishing the Institution of Civil Engineers, and succeeded him as President; and on the institution of the University of London, he was nominated in the Charter among the original members of the Senate.

In private life he was much respected; he died on the 8th of October 1862.